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5090
Ser OPDE.MC/5108
March 31, 2005

Ms. Laurie Racca
California Environmental Protection Agency
Dept. of Toxic Substances Control – Region 1
Office of Military Facilities
8800 Cal Center Drive
Sacramento, CA 95826

Dear Ms. Racca:

**SUBJECT: SUBMITTAL OF THE FINAL ACTION MEMORANDUM AND WORK PLAN FOR SITE 23 AT
NAVAL AIR WEAPONS STATION CHINA LAKE**

The Department of the Navy and the Department of Toxic Substances Control (DTSC) have been conducting informal dispute resolution discussions in accordance with the Federal Facility Site Remediation Agreement (FFSRA), regarding the State's February 24, 2005 disapproval letter of the Draft-final Action Memorandum (AM) for Site 23. The informal dispute resolution period was previously extended by mutual agreement until March 18, 2005.

It is the Navy's understanding that the informal dispute process resulted in the parties' conceptual agreement on the outstanding technical issues, and the agreement to withdraw the dispute by the Navy. The final AM and the final response to comments, enclosure (1), have been revised to incorporate comments and recommendations from the California Environmental Protection Agency as agreed to in the informal dispute process. The Navy is planning to initiate fieldwork for the removal action during the week of April 18, 2005.

The final AM and work plan for site 23 is being issued as part of the Navy's Administrative record for the Installation Restoration Program which is conducted under the Comprehensive Environmental Response, Compensation and Liability Act, and consistent with the National Oil and Hazardous Substances Pollution Contingency Plan.

If you would like any additional information, please call me at (619) 532-4208.

Sincerely,

MICHAEL J. CORNELL
Lead Remedial Project Manager
By direction of the Commander

Enclosure: 1. Final Action memorandum and work plan for Site 23

Copy to:

Mr. Doug Feay, California Regional Water Quality Control Board – Lahontan Region
Mr. Jim McDonald, Naval Air Weapons Station, China Lake
Captain Mark Storch, RAB Co-Chair
Mr. Lee Sutton, RAB Co-Chair
Mr. Craig L. McKenzie, RAB Member
Mr. Raymond Kelso, RAB Member
Mr. Dan R. Starkey, R.E.H.S., RAB Member
Ms. Vicki Lake, California Department of Fish and Game
Ms. Julie Yamamoto, California Department of Fish and Game
Ms. Judy Gibson, U.S. Fish and Wildlife Service
Mr. Rocky Thompson, California Department of Fish and Game

Final

**ACTION MEMORANDUM
INSTALLATION RESTORATION
PROGRAM SITE 23,
K-2 SOUTH DISPOSAL AREA,
TIME-CRITICAL REMOVAL ACTION
Naval Air Weapons Station China Lake, California**

April 2005




**U.S. DEPARTMENT OF THE NAVY
Southwest Division
Naval Facilities Engineering Command
San Diego, California**

OFFICE OF MILITARY
FACILITIES PROGRAM

APR 11 2005

CALIFORNIA DEPARTMENT OF
TERRITORIAL AND MARINE CONTROL

"I certify that the information contained in or accompanying this submittal is true, accurate, and complete. As to those portions of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared at my direction in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature: 

Name: MICHAEL J. CORNELL

Title: LEAD REMEDIAL PROJECT MANAGER

Date: _____

CONTENTS

ACRONYMS and ABBREVIATIONS	iv
1.0 PURPOSE	1
2.0 SITE CONDITIONS AND BACKGROUND	3
2.1 Description of Site	3
2.1.1 Removal Site Evaluation.....	3
2.1.2 Physical Location.....	4
2.1.3 Site Characteristics.....	5
2.1.4 Environmental Setting	5
2.1.5 Release or Threatened Release into the Environment of a Hazardous Substance or Pollutant or Contaminant.....	8
2.1.6 NPL Status	9
2.1.7 Maps, Pictures, and Other Graphic Representations	9
2.2 Other Actions to Date	9
2.2.1 Previous Actions	9
2.2.2 Current Actions.....	11
2.3 State and Local Authorities Roles.....	11
2.3.1 State and Local Actions to Date.....	11
2.3.2 Potential for Continued State and Local Response.....	11
3.0 THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES	12
3.1 Threats to Public Health or Welfare	12
3.2 Threats to the Environment.....	14
4.0 ENDANGERMENT DETERMINATION	14
5.0 PROPOSED ACTIONS AND ESTIMATED COSTS	14
5.1 Proposed Action.....	14
5.1.1 Proposed Action Description	15
5.1.2 Contribution to Remedial Performance	16
5.1.3 Description of Alternative Technologies	16
5.1.4 Engineering Evaluation/Cost Analysis	18
5.1.5 Applicable or Relevant and Appropriate Requirements	18
5.1.6 Project Schedule.....	20
5.2 Estimated Costs.....	20

CONTENTS (CONTINUED)

6.0	EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN	21
7.0	PUBLIC INVOLVEMENT	21
8.0	OUTSTANDING POLICY ISSUES	21
9.0	RECOMMENDATION	22
10.0	REFERENCES	23

APPENDICES

- A Preliminary Assessment Analytical Data
- B Response to Agency Comments
- C Screened Applicable, Relevant and Appropriate Requirements

FIGURES

- 1 Location Map
- 2 Site 23 – K-2 South Disposal Area Preliminary Assessment Sampling Locations
- 3 Preliminary Assessment Test Pit Cross Sections

TABLES

- 1 Summary of Maximum Explosives and Pesticide Detections Observed During Preliminary Assessment of IRP Site 23
- 2 Special Status Species Potentially Occurring at Site 23
- 3 Federal Chemical-Specific Applicable or Relevant and Appropriate Requirements
- 4 State Chemical-Specific Applicable or Relevant and Appropriate Requirements
- 5 Federal Location-Specific Applicable or Relevant and Appropriate Requirements
- 6 State Location-Specific Applicable or Relevant and Appropriate Requirements
- 7 Federal Action-Specific Applicable or Relevant and Appropriate Requirements
- 8 State Action-Specific Applicable or Relevant and Appropriate Requirements

ACRONYMS AND ABBREVIATIONS

ARAR	Applicable or relevant and appropriate requirement
ATSDR	Agency for Toxic Substances and Disease Registry
beta-BHC	Beta-benzene hexachloride
bgs	Below ground surface
Ca-HSC	California Health and Safety Code
Cal/EPA	California Environmental Protection Agency
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Chemical of concern
DERP	Defense Environmental Restoration Program
DoD	Department of Defense
DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
HRS	Hazard ranking system
IRP	Installation Restoration Program
LDR	Land disposal restriction
µg/L	Micrograms per liter
mg/kg	Milligrams per kilogram
MK	Morrison Knudsen Corporation
MOJAQMD	Mojave Desert Air Quality Management District
NAWS	Naval Air Weapons Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OSWER	Office of Solid Waste and Emergency Response
PA	Preliminary Assessment
PCB	Polychlorinated biphenyl
PRC	PRC Environmental Management, Inc.
PRG	Preliminary remediation goal
PRP	Potentially responsible party
Qaf	Quaternary alluvial fan
Qps	Quaternary aeolian sands/interdune playa deposits

ACRONYMS AND ABBREVIATIONS (Continued)

RCRA	Resource Conservation and Recovery Act
RDX	Royal demolition explosive
RWQCB	Regional Water Quality Control Board
SAP	Sampling and analysis plan
SI	Site Inspection
SVOC	Semivolatile organic compound
TCRA	Time-critical removal action
Tetra Tech	Tetra Tech EM Inc.
TSCA	Toxic Substances Control Act
U.S.C.	United States Code
UXO	Unexploded ordnance
VOC	Volatile organic compound

ACTION MEMORANDUM

**Commanding Officer
Naval Air Weapons Station
China Lake, California 93555**

April 2005

**SUBJECT: Action Memorandum for Removal Action at K-2 South Disposal
Area (Installation Restoration Program Site 23), NAWS China
Lake, California**

Site Status:	Non-NPL
Category of Removal:	Time Critical Removal Action (TCRA)
CERCLIS ID:	Not Applicable
Site ID:	Installation Restoration Program (IRP) Site 23

1.0 PURPOSE

The purpose of this action memorandum is to document, for the administrative record, the U.S. Department of the Navy's decision to undertake a time-critical removal action (TCRA) of soil and debris contaminated with the pesticide isomer beta-benzene hexachloride (beta-BHC) and royal demolition explosives (RDX) at Installation Restoration Program (IRP) Site 23 (Site 23). Site 23 is located at Naval Air Weapons Station (NAWS) China Lake, in China Lake, California (Figure 1). The Department of Defense (DoD) has the authority to undertake Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response actions, including removal actions, under 42 United States Code (U.S.C.) §9604, 10 U.S.C. §2705, and federal Executive Order 12580 as amended. Further, this removal action is consistent with Division 20, Chapter 6.8 of the California Health and Safety Code (Ca-HSC).

The primary objectives of the proposed TCRA are to (1) reduce high levels of hazardous substances in soils largely at or near the surface that may migrate, and (2) reduce the potential for migration of near-surface contaminants by surface drainage, erosion, or wind transport. It is necessary to remove the contaminant source area and resultant high levels of contamination in soils to achieve these primary objectives. This proposed removal action defines the contaminant source area as soils that contain concentrations of site contaminants above residential preliminary remediation goals (PRGs). The proposed TCRA will consist of removing contaminated soil and debris in the defined trench areas at Site 23, replacing excavated materials with clean soil backfill, transporting the soil and debris off site, and disposing the soil and debris at an approved facility. As a result, the proposed action will substantially reduce exposure of hazardous substances to ecological receptors at the site through the pathways identified at Site 23. This TCRA is anticipated to remove site contaminants to or below residential PRGs. Field screening with off-site analytical laboratory confirmation will be used during the TCRA. Soil confirmation samples will be collected after the removal action and sample results will be documented in a confirmation report that will indicate whether the removal action is complete or an expanded site inspection (SI) is recommended.

A secondary objective of the proposed TCRA is to verify the presence of beta-BHC in groundwater. Low levels of beta-BHC were detected during limited groundwater sampling that was conducted in 2002 as part of the 11-site preliminary assessment (PA) and SI field investigation. Analytical results from the one groundwater sample obtained during the PA indicate that groundwater may be contaminated by beta-BHC and that further characterization of the site is warranted as a result. Additional groundwater samples collected from temporary monitoring wells are necessary to accurately assess the direction of groundwater movement and the nature and extent of groundwater contamination beneath and west of the site. Temporary wells will be constructed in a manner that will prevent surface contamination from migrating to the subsurface and will be securely capped when not in active service. Following installation, temporary monitoring wells will be surveyed by a California-licensed land surveyor.

The proposed TCRA for Site 23 is deemed consistent with the factors set forth in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) at Title 40 of the Code of Federal Regulations (40 CFR) Part 300, and Chapter 6.8 of the Ca-HSC. Factors set forth within the NCP and that pertain to Site 23 are as follows:

- “High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.”
- “Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations, animals, or food chains.”
- “Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.”

These findings are discussed in more detail in Section 3. For additional details on the criteria for the TCRA, see Section 300.415[b][2] of the NCP and Ca-HSC Section 25356.1 et seq. (U.S. Environmental Protection Agency [EPA] 1990).

No nationally significant or precedent-setting issues exist for this site.

2.0 SITE CONDITIONS AND BACKGROUND

This section presents the description, location, and background for Site 23 and the physical characteristics and past releases from the site, as well as the regulatory status and current and previous actions.

2.1 DESCRIPTION OF SITE

The following sections describe Site 23.

2.1.1 Removal Site Evaluation

From 1951 to 1981, range waste was reportedly emplaced in two trenches at the site. Historical records indicate that the trenches received construction and demolition debris, bomb casings, concrete, wood, and scrap metal that resulted from testing in the area. This site was reported to be the site of disposal of unopened 1- and 5-gallon cans of chlordane from a Navy installation in Barstow, California, that were reportedly received in the 1970s (WESTEC Services, Inc. 1984). Navy personnel interviewed during the 1996 site reconnaissance confirmed that some of the approximately 17,000 gallons of chlordane in 1- to 5-gallon containers had been placed at Site 23 (PRC Environmental Management, Inc. [PRC] and Morrison Knudsen Corporation [MK] 1997).

The Navy conducted a PA/SI to further assess the degree of contamination associated with Site 23 (Tetra Tech EM Inc. [Tetra Tech] 2003). A broken wooden pallet was encountered at approximately 6 feet below ground surface (bgs) during sampling conducted as part of the PA during March through May 2002 that apparently held a number of 5-gallon cans. The cans had disintegrated, leaving only a white powder residue. Analysis of a sample collected in the area of the white powder residue revealed RDX detected at a concentration of 46 milligrams per kilogram (mg/kg), which is above the EPA Region IX PRG of 4.4 mg/kg (residential) and 16 mg/kg (industrial). Ten pesticides were also detected, with beta-BHC noted at the highest concentration at 2,000 mg/kg. This value exceeds both the residential and industrial PRGs of 0.32 mg/kg (residential) and 1.3 mg/kg (industrial). Analytical results indicate that beta-BHC was the primary active ingredient in the 5-gallon cans. Additionally, of the 10 pesticides detected during the PA, two (dieldrin and gamma-BHC) were detected at concentrations that were above the residential but below the industrial PRG. Maximum detections of pesticides and explosives can be found in Table 1.

Calcium was also detected at a concentration of 316,000 mg/kg in the white powder. No screening criteria have been established for calcium or other essential nutrients that are not priority pollutants. This value does exceed the average background concentration range for subsurface soil (8,890 to 206,000 mg/kg) for quaternary alluvial fan (Qaf) and quaternary aeolian sands/interdune playa (Qps) deposits in this area. The substance is suspected to be calcium oxide (lime), which may have been the carrier in or used to absorb the beta-BHC (Tetra Tech 2003).

Three subsurface soil samples were collected at Site 23. No volatile organic compounds (VOC) were detected at concentrations above PRGs. Arsenic was the only metal detected at a concentration above PRGs, but it was within the range of background concentrations for Qaf and Qps composite soils. Detected activities of uranium isotopes were all below the range of background (Tetra Tech 2003).

Additionally, one groundwater sample (V8004) was collected at approximately 47 feet bgs using a temporary well in a soil boring about 120 feet downgradient from the disposal trench. The sample location is shown on Figure 2. No explosives were detected in the groundwater sample. Antimony, arsenic, and manganese were detected at concentrations that exceeded tap water PRGs, however. The pesticide beta-BHC was detected at a concentration of 0.056 micrograms per liter ($\mu\text{g/L}$), which is above the EPA Region IX tap water PRG of 0.037 $\mu\text{g/L}$. Four VOCs were detected, and one, benzene, was detected at an estimated concentration of 1.6 $\mu\text{g/L}$, slightly above the California Department of Health Services maximum contaminant level of 1 $\mu\text{g/L}$. Another attempt to collect a groundwater sample was made at location WG23-SB01, but no groundwater was observed before bedrock was encountered at 40 feet bgs.

Concrete debris, rock cores, wooden cases, scrap metal, parachute material, rope, piping, wood scrap, and ordnance waste had been piled on the ground surface south of the trenches. Several manmade dirt mounds were also noted (PRC and MK 1997). Surface samples were collected from these mounds during the PA. No explosives or semivolatile organic compounds (SVOC) were detected in any of the surface soil samples. Polychlorinated biphenyls (PCB) were detected at concentrations below industrial and residential PRGs. Arsenic was detected at concentrations that exceeded the residential and industrial PRGs but that were within the range of background for the Qaf/Qps composite soils at the site. Cadmium was detected at concentrations that exceeded the range of background concentrations, but was below industrial and residential PRGs. Detected activities of uranium isotopes were all below the range of background.

In addition to the waste found in 1996, oil filters, spray cans, tank or aircraft parts, rocket and flare canisters, electronics, and vehicle batteries were also observed during the 2000 site reconnaissance (Tetra Tech and Washington Group, Inc. 2002).

2.1.2 Physical Location

Site 23, the K-2 South Disposal Area, is located in NAWS China Lake, in the K-2 range in the northern section of the China Lake Complex. Site 23 lies adjacent to North Knox Road. The site is 5 miles from the NAWS China Lake military housing complex, near the intersection of Lauritsen Road and Inyokern Road (see Figure 2).

The primary mission of the facility is research, development, testing, and evaluation of naval weaponry. NAWS China Lake is located within the Indian Wells Valley in the Mojave Desert; its semiarid climate results from the rain shadow created by the Sierra Nevada. The average annual precipitation from 1992 through 2002 in the area ranges from 1.23 to 9.90 inches per year (Naval Air Warfare Weapons Division [<http://www.nawcwpns.navy.mil>]). Most of the precipitation occurs between October and March, with December the wettest month. Typical

desert thunderstorms occur in the late summer. Precipitation falls in the form of rain, with the exception of occasional snow at the higher elevations during the winter.

There are no residences or public areas or facilities within a 1-mile radius of Site 23. Surface drainage of Site 23 is generally to the west, into the adjacent China Lake Playa. Vegetation in NAWS China Lake is typical of the Mojave Desert; however, the north range, especially at higher elevations, reflects an environment that is transitional between the Mojave and the Great Basin deserts.

Approximately 35 species of reptiles and amphibians, 310 species of birds, and 46 species of mammals have been observed at NAWS China Lake; the greatest diversity and density of species occurred in wetland and riparian areas in the China Lake Complex. Larger mammals include the kit fox (*Vulpes macrotis arsipus*), coyote (*Canis latrans*), and bobcat (*Felis rufus*). Four threatened and endangered species at NAWS China Lake are considered management issues: (1) the Mohave tui chub (*Gila bicolor mohavensis*), (2) the desert tortoise (*Gopherus agassizii*), (3) the Inyo California towhee (*Pipilo crissalis eremophilus*), and (4) the Mohave ground squirrel (*Spermophilus mohavensis*). The remainder are migratory or transient species most likely to use wetland and riparian areas and hence are protected as listed species.

2.1.3 Site Characteristics

NAWS China Lake is a federally owned facility and is currently operated and maintained by the Navy. The primary function of NAWS China Lake is weapons testing and evaluation. Contamination detected at Site 23 appears to be the result of historical disposal and subsequent degradation of discarded containers. Based on available information, Site 23 does not appear to have been developed in the past. There is no current use of Site 23, and the possibility that Site 23 would be used in the future for residential and commercial purposes is considered extremely remote. Navy personnel conducted a cultural resources survey before field work began for the PA/SI in August and November 2002. The survey concluded that no cultural resources are present at Site 23 (McDonald 2004)

2.1.4 Environmental Setting

Site 23 is located east of the China Lake playa at an elevation of about 2,160 feet above mean sea level (Figure 2). The dominant plant community at Site 23 is Saltbush Scrub, which is dominated by *Atriplex* species. This community is transitional between the Alkali Sink Scrub that immediately borders the playa to the west of Site 23, and the Creosote Bush Scrub community, which covers the bajada slope east of the site (dominated by creosote bush, *Larrea tridentata*). This sequence is typical of much of the terrain surrounding the China Lake playa and is primarily related to alkali and salt tolerance.

2.1.4.1 Vegetation

Vegetation at this site is dominated by *Atriplex* species, which are perennial evergreen shrubs. These saltbushes represent about 60 percent of the vegetation cover near the site. *Atriplex* specimens ranged from about 1 to 3 feet tall and occur on coppice mounds. Dried remnants of an annual grass were also observed.

2.1.4.2 Fauna

No animal species were directly observed during the site visit. The species present, as indicated by indirect means, are listed in the table below.

Taxon	Evidence
<i>Dipodomys merriami</i> (Merriam kangaroo rat) ¹	Tracks, burrows
<i>Chaetodious/Perognathus</i> spp. (pocket mice) ¹	Tracks, burrows
<i>Lepus californicus</i> (blacktailed jackrabbit)	Scat

Notes:

1 Primarily on coppice mounds

The low diversity of vegetation and the relative lack of cover at the site likely result in a reduced animal diversity when compared with the adjacent Creosote Bush Scrub. Birds that are resident to the desert should be transient in this habitat, as would be many migrants, but no species are likely to nest at the site. Predators such as the western red-tailed hawk (*Buteo jamaicensis*) or the greater roadrunner (*Geococcyx californianus*) are likely to be opportunistic feeders here, as are scavengers such as the turkey vulture (*Cathartes aura teter*) or the common raven (*Corvus corax*). Other vertebrates that may occur at the site are listed below; many would be casual migrants from the Creosote Bush Scrub community to the east.

2.1.4.3 Mammals

- Coyote (*Canis latrans*)
- Deer mouse (*Peromyscus* spp.)
- White-tailed antelope squirrel (*Ammospermophilus leucurus*)

2.1.4.4 Reptiles

- Desert tortoise (*Gopherus agassizii*)
- Zebra-tailed lizard (*Callisaurus draconoides*)
- Side-blotched lizard (*Uta stansuriana stejnegeri*)

- Desert horned lizard (*Phrynosoma platyrhinos calidiarum*)
- Western whiptail (*Cnemidophorus tigris tigris*)
- Coachwhip snake (*Uvasticophis flagellum piceus*)
- Gopher snake (*Pituaphis melanleucus deserticola*)
- Mojave rattlesnake (*Crotalus scutulalus scutulatus*)

During a site visit in November 2004, an apparent abandoned desert tortoise burrow was observed by field personnel. To protect biological resources that may be present at Site 23, mitigation measures for sensitive species present at Site 23 will be implemented prior to and during the removal action. The mitigation measures are from China Lake's Desert Tortoise Habitat Management Plan.:

1. Worker education programs and well-defined operational procedures shall be implemented to avoid the take of desert tortoises and minimize loss of their habitat.
2. Take of desert tortoises, through injury or death due to the straying of vehicles or equipment beyond project areas, shall be reduced through establishment of clearly defined work areas.
3. Take of desert tortoises, through injury or death, found within proposed project areas shall be reduced through the removal of these animals to safe, undisturbed areas adjacent to project sites. (For Mohave ground squirrels, removal and relocation is much more difficult and not expected to take place. If the opportunity arises, reasonable efforts will be made.)
4. Attraction of common ravens and other potential tortoise predators to project areas shall be reduced to the maximum extent possible by strictly controlling trash and project refuse.
5. The Station shall continue to manage for the benefit of desert tortoises the approximately 200,000 acres within the Station as described in the original biological opinion for the Management Plan.

The mitigation measures implemented for the protection of the desert tortoise will also be protective of special status species that may be present at Site 23.

Invertebrates in this habitat are likely to include many species, probably dominated by ground beetles (*Tenebrionidae*), weevils (*Curculionidae*), gall forming wasps on *Atriplex* (*Hymenoptera*), grasshoppers (*Orthoptera*), flies (*Diptera*), harvester ants (*Pogonomyrmex* species), and ground spiders (*Lycosidae*).

Based on a search of the California Natural Diversity Data Base, a number of sensitive species may be at or near the site, such as the desert tortoise (*Gopherus agassizii*). Table 2 lists special status species that are known to occur in the vicinity of Site 23.

The proposed removal action is scheduled to occur in April 2005. This removal action is the first proposed at Site 23. Before the removal action begins, the NAWs China Lake biologist will conduct a site visit to ensure that the federally endangered desert tortoise will not be affected.

2.1.5 Release or Threatened Release into the Environment of a Hazardous Substance or Pollutant or Contaminant

Several test pits were excavated during the PA/SI at Site 23 where an earlier geophysical survey identified a metallic target. The materials encountered in these test pits indicate that the site may pose a risk to ecological receptors. In addition, future erosion by surface water and wind may breach the trench cover and expose the contents to nearby ecological receptors.

Concentrations of pesticides and explosives, specifically beta-BHC and RDX found in the disposal trench, are hazardous substances as defined by Section 101(14) of CERCLA, and are pollutants or contaminants, as defined by Section 101(33) of CERCLA. As stated in Section 2.1.1, RDX was detected at a concentration of 46 mg/kg, above the residential PRG of 4.4 mg/kg and the industrial PRG of 16 mg/kg, and beta-BHC was detected at a maximum concentration of 2,000 mg/kg. This value exceeds both the residential (0.32 mg/kg) and industrial (1.3 mg/kg) PRGs. It is estimated that the volume of beta-BHC in the trench was between 50 and 500 gallons.

A number of additional pesticides were also detected in samples collected from the test pits excavated during the PA, but were found to be at concentrations below residential and industrial PRGs. Nine pesticides were detected in samples collected from Pit No. 1 (WG23-EXCV01). Five pesticides were detected in Pit No. 3 (WG23-EXCV03). Maximum detected concentrations of pesticides and explosives and the associated residential and industrial PRGs can be found in Table 1.

The detection of beta-BHC in groundwater at concentrations above tap-water PRGs appears to confirm that the pesticide has migrated from the unlined trench to the groundwater. Low levels of beta-BHC indicate that groundwater has likely been contaminated. The results of the limited field investigation indicated that further characterization of the site is warranted. Additional groundwater samples collected from temporary monitoring wells are necessary to accurately assess the direction of groundwater movement and the nature and extent of groundwater contamination beneath and west of the site.

The upper 5 to 10 feet of sediment at Site 23 consist of windblown sand and silt that are interbedded with alluvial deposits and colluvium. This soil is considered to represent Qaf/Qps deposits at NAWs China Lake (Tetra Tech 1998). Basement rock crops out upslope of Site 23. Consequently, groundwater is not expected to be present northeast of the trenches.

2.1.6 NPL Status

Site 23 is neither listed on the National Priorities List (NPL) nor has it been proposed for the NPL. Site 23 has not received and is not expected to receive a Hazard Ranking System (HRS) designation. Site 23 is not being evaluated by the Agency for Toxic Substances and Disease Registry (ATSDR) for the need to dissociate residents from threats. Various phases of remedial activities, including PAs/SIs, remedial investigations and feasibility studies, other removal or remedial actions, and post-remediation monitoring, are in progress at other IRP sites at NAWS China Lake.

2.1.7 Maps, Pictures, and Other Graphic Representations

All figures relevant to this action memorandum are presented following Section 10.0 References. The general location of NAWS China Lake is shown in Figure 1. The previous sampling locations at Site 23 during the PA and the interpreted zone of subsurface debris are shown in Figure 2. Cross-sections of test pits excavated in the trench area of Site 23, as inferred from information obtained during the PA/SI (Tetra Tech 2003), are shown in Figure 3.

2.2 OTHER ACTIONS TO DATE

This section discusses previous and current actions at Site 23.

2.2.1 Previous Actions

Site reconnaissance events were performed in both 1996 and 2000. Trenches were determined to be side-by-side and parallel to North Knox Road during the 1996 and 2000 site visits. Investigators noted during the 1996 reconnaissance that the color of the northern portion of the trenches was different than the southern portion (PRC and MK 1997). This difference in color was interpreted to be the result of a shallow drainage that cut through both trenches. The contents of the trenches did not appear to have been exposed by erosion along the drainage pathway (Figure 2).

In March 2002, a surface geophysical investigation was performed at Site 23 to locate the boundaries of the disposal trenches and to identify any possible buried objects adjacent to the trenches. The surveyed area encompassed 29,100 square feet. An anomaly in the northern portion of the surveyed area was identified as one aboveground object, a sign post that read "Warning Flammable Material Only." Based on available historical information and observations during the PA/SI phase of investigation at Site 23, there are no known indications of burning or burned materials at Site 23. No indication of burned material (such as burn ash, melted glass, or fused material) was found in the surface debris or the test pits excavated in the area of magnetic anomaly during the PA/SI.

A second anomaly in the central part of the investigation area identified by the previous surveys was interpreted as an accumulation of buried metallic debris arranged in a linear pattern within

the trench. Only one trench was identified at this site based on the geophysics and observations of the surface depression. However, the single trench could be the result of two bulldozer blade-widths, which suggests that two trenches were originally present and have since merged into one.

Three test pits were excavated during the PA/SI, performed from March to May 2002 to evaluate the subsurface conditions of the trench. One test pit was excavated in the target zone of the trench identified during the geophysical survey, and one test pit was excavated at each end of the debris. The locations of the test pits are shown on Figure 2. Cross sections of the test pits at each sample location are shown on Figure 3.

The trench cover material at the location of Pit No. 1 (WG23-EXCV01) had subsided 6 to 18 inches, revealing an obvious outline of the trench. The excavation in the center of the magnetic anomaly revealed that the trench cover consisted of about 3 to 4 feet of blown sand and sheetwash alluvial sand covering about 4 to 6 feet of backfill that contained debris. Scrap metal and wood were noted. One or two wood pallets with the remains of 5-gallon metal cans that contained a white powder that emitted a strong pesticide-like odor were uncovered. The metal cans were almost completely oxidized; the rims and handles were the only portions of the cans that remained. Both the surrounding soil and white powder were sampled and analyzed for isotopic uranium, explosives, metals, pesticides, PCB compounds, SVOCs, and VOCs. Pesticide-like odors were also noted from the soil uncovered around the debris. Iron and oxidized soil appeared at the trench floor and may be the oxidized remains of the metal containers (Tetra Tech 2003).

The southernmost excavation, Pit No. 2 (WG23-EXCV02), revealed no significant debris. The trench cover was similar to the location of Pit No. 1. A single metal access plate and the rusted remains of a small can were the only debris observed.

Pit No. 3 (WG23-EXCV03) revealed a trench cover similar to Pit No. 1, but the northeastern end of the trench contained a significant amount of redwood pallets and wood that appeared to be the remains of scaffolding or a test stand. Several 2.5-gallon rusted cans were found that retained a strong petroleum odor. One of the cans was labeled "The Petroleum Company Inc., August 66, Batch 1090" and "Insulating Electrical Oil." An iron-oxidized horizon was observed at the bottom in that same end of the trench.

An additional isolated anomaly was detected in the southwestern part of the study area and is consistent with the accumulation of surface debris noted during the site reconnaissance (Tetra Tech and Washington Group, Inc. 2002). Four surface soil samples (WG23-SL01 to WG23-SL04) were collected at the area of surface debris (Figure 2). No explosives or SVOCs were detected in any of the surface soil samples. PCBs were detected in one of the surface samples (WG23-SL02) at a concentration of 0.12 mg/kg, below the residential PRG of 0.22 mg/kg and the industrial PRG of 0.74 mg/kg. The concentration of PCBs detected in surface sample WG23-SL02 is also below the Toxic Substances Control Act (TSCA) cleanup level for high-occupancy areas of 1 mg/kg. Arsenic was detected at concentrations that exceeded the residential and industrial PRGs but that were within the range of background for Qaf/Qps composite soils at the site. Cadmium was detected at concentrations that exceeded the range of

background concentrations. Detected activities of uranium isotopes were all below the range of background.

Pesticides and explosives detected are summarized in Table 1. Results for all analyses during the PA are provided in Appendix A.

2.2.2 Current Actions

No other government or private entities are currently undertaking any actions to address contamination at Site 23.

2.3 STATE AND LOCAL AUTHORITIES ROLES

This section discusses the roles and involvement of state and local agencies in actions at Site 23.

2.3.1 State and Local Actions to Date

As previously described, federal Executive Order 12580, as amended, delegates to the Department of Defense the President's authority to undertake CERCLA response actions. Congress further outlined this authority in its Defense Environmental Restoration Program (DERP) Amendments, which can be found at 10 U.S.C. §2701-2705. Both CERCLA §120(f) and 10 U.S.C. §2705 require Navy facilities to ensure that state and local officials be afforded the timely opportunity to review and comment on Department of the Navy response actions. CERCLA §120 further requires the Navy to apply state requirements for removal and remedial actions at its facilities. Accordingly, the State of California Department of Toxic Substances Control (DTSC) and the Lahontan Regional Water Quality Control Board (RWQCB) have provided technical advice and oversight during the PA phases of the IRP. The Navy has also conducted a site visit on January 15, 2004, to familiarize DTSC personnel with the site.

2.3.2 Potential for Continued State and Local Response

DTSC and RWQCB have provided input throughout the PA and are expected to continue to provide input and assistance during this removal action and to continue to do so throughout the IRP process. It is expected that the Navy's Defense Environmental Restoration Program funds will continue to be the exclusive source of funding for this program.

3.0 THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

In accordance with the NCP, the following threats must be considered in evaluating the appropriateness of a removal action (40 CFR §300.415(b)(2)):

- Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations, animals, or food chains.
- Actual or potential contamination of drinking water supplies or sensitive ecosystems.
- Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release.
- High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.
- Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.
- Threat of fire or explosion.
- Other situations or factors that may pose threats to public health or welfare or the environment.

3.1 THREATS TO PUBLIC HEALTH OR WELFARE

Three of the above threats apply to conditions at Site 23, the K-2 South Disposal Area.

- High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.
- Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations, animals, or food chains.
- Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.

Soils near the ground surface are a threat because they may contain chemicals of concern (COC) (RDX and beta-BHC) at concentrations that exceed both residential and industrial PRGs. The concentration of beta-BHC (2,000 mg/kg) detected in a sample collected near the center of an area of magnetic anomaly were more than three orders of magnitude higher than the residential PRG for soil of 0.32 mg/kg. The nature of these risks indicates that removing contaminated material is required to mitigate potential threats to human health and the environment.

The contaminants at Site 23, however, are not believed to pose a threat to human receptors based on the relative isolation of Site 23 from human populations. As such, the potential exposure risks — posed by pathways such as ingestion, dermal contact, and inhalation of soil — are believed to be minimal. As stated in Section 2.1.2, there are no residences, public areas, or facilities within a 1-mile radius of Site 23.

The trenches at Site 23 are covered with native soil up to several feet thick. Saltbush scrub has rooted in the native soils and has helped to stabilize the ground cover on and adjacent to the trenches. These cover materials help to minimize risk to potential receptors that could be associated with blowing dust and erosion.

Although Site 23 is not believed to pose a risk of exposure to human receptors, weather conditions such as wind and rain may cause COCs to migrate from Site 23. High levels of COCs at or near the surface of Site 23 may migrate as a result of windblown soils or surface erosion caused by occasional storms. Analytical results obtained from a grab groundwater sample collected near Site 23 exhibited a concentration of 0.056 µg/L, indicating that groundwater may be contaminated by beta-BHC. The EPA tap water PRG for beta-BHC is 0.037 µg/L.

The recommended action described in this action memorandum will address these potential threats to human health.

Beta-BHC is a chlorinated pesticide and is classified by EPA as a possible human carcinogen. It has been in use as a broad-range insecticide for 50 years, long enough to build up a significant body of evidence on its toxic and environmental hazards. Beta-BHC is toxic to aquatic organisms and may cause long-term effects in the aquatic environment. Moreover, it has the potential to bioaccumulate in ecological and human food chains. It has caused deaths and poisonings in humans, and its long-term health effects, including carcinogenic effects, are recognized. Scientific and anecdotal evidence links lindane (gamma-BHC) and its isomers (including beta-BHC) with serious health problems, including aplastic anemia, birth disorders, and breast cancer (Pesticides Trust 1999).

RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine), also known as cyclonite or hexogen, is used as an explosive and also in combination with other ingredients in explosives. RDX is produced at military arsenals and is used as an explosive in military ammunitions and plastic explosives. RDX is a manmade chemical that does not occur naturally in the environment.

No studies are available on representative effects in humans after inhalation or oral or dermal exposure to RDX; however, a laboratory study in mice administered RDX orally found RDX could cause liver tumors. In addition, exposure to large amounts of RDX can cause seizures. EPA has listed RDX as a possible human carcinogen via oral exposure as a result of the mouse study. No studies have been conducted on the carcinogenicity to humans through oral consumption (drinking or eating) of RDX (Impact Area Groundwater Study Program 2003). RDX enters the environment through several potential pathways of migration: particles become airborne during burning; in addition, RDX can enter water or soil from waste leachate.

Furthermore, RDX does not adsorb strongly to soil and is soluble in water. Unlike beta-BHC, RDX does not readily bioaccumulate in aquatic species or humans.

3.2 THREATS TO THE ENVIRONMENT

Three threats listed in Section 300.415(b)(2) of the NCP apply to conditions at Site 23 at NAWS China Lake. These threats are (1) actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations, animals, or food chains; (2) high levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate; and (3) weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.

As is common with other organochlorine pesticides, beta-BHC is fat-soluble, which contributes to its tendency to bioaccumulate through food chains. Residues have been detected in the kidneys, liver, and adipose tissue of a wide variety of wild animals and birds. It is highly toxic to aquatic invertebrates and fish.

Data presented in the PA demonstrate an increased risk to environmental receptors because of concentrations of pesticides and RDX, and particularly beta-BHC. The nature of these risks indicates that contaminated material must be removed to mitigate potential threats to the environment.

Weather conditions such as wind and rain may cause COCs to migrate from Site 23. COCs at or near the surface of Site 23 may migrate as a result of windblown soils or through surface drainage and erosion caused by occasional storms. As stated in Section 3.1, analytical results obtained from a groundwater sample collected near Site 23 exhibited a concentration of 0.056 µg/L, indicating that groundwater may be contaminated by beta-BHC.

4.0 ENDANGERMENT DETERMINATION

Results of the PA conducted for Site 23 demonstrate that current conditions at Site 23 may present a threat to the public health, welfare, or the environment if the waste source is not removed. The contamination, as described in Sections 3.1 and 3.2, presents an imminent or substantial endangerment of (1) exposure, and (2) migration that may contaminate air, soil, or water by the spread of contamination to other areas.

5.0 PROPOSED ACTIONS AND ESTIMATED COSTS

5.1 PROPOSED ACTION

This section describes the proposed TCRA as a preferred response action alternative, as well as other alternatives that were evaluated but not selected. Applicable or relevant and appropriate requirements (ARAR) and the proposed project schedule are also discussed. The discussion of

the proposed preferred alternative and its associated work plan satisfy the substantive requirements for removal action work plans in Ca-HSC §25323.1 or for remedial action plans in Ca-HSC §25356.1.

5.1.1 Proposed Action Description

The proposed action for the Site 23 consists of the following actions:

- Remove soil that contains COCs at concentrations above residential PRGs from the ground surface to approximately 10 feet bgs or shallower if confirmation sampling and analysis during excavation confirm that the source has been removed.
- Clear unexploded ordnance (UXO) at each excavation lift. Each lift is expected to be approximately 2 feet.
- Collect random confirmation soil samples from each excavation lift.
- Analyze all confirmation samples for pesticides, explosives compounds, and VOCs using a state-certified off-site laboratory.
- Analyze confirmation samples collected from the sidewalls of the upper four feet of the excavation for pesticides, explosives compounds, VOCs, SVOCs, PCBs, and metals.
- Based on the results of the confirmation samples, excavation may be extended laterally in an appropriate direction. The excavation will continue approximately 5 feet horizontally along the representative portion of the sidewall where confirmation samples were collected and results exceed the residential PRG. In addition, the excavation will continue downward in 2-foot lifts to a maximum of 10 feet bgs should results for the bottom confirmation samples exceed the residential PRGs.
- After the removal activities are complete, three temporary monitoring wells will be installed and sampled to obtain additional groundwater characterization data. Groundwater samples will be analyzed for VOCs, explosives, perchlorate, and pesticides.
- Results will be documented in an on-scene coordinator's report.
- Additional samples will be required as the excavation increases in length and depth, at a rate of one sample per 325 square feet, of excavation floor and sidewall area in accordance with the Site 23 TCRA work plan.
- No contamination at concentrations that exceed residential PRGs will be left in place between the ground surface and approximately 10 feet bgs except where practical constraints limit excavation.

- Excavated soil will be properly stockpiled to limit or prevent runoff.
- Although unlikely, any perched groundwater encountered during excavation will be contained and disposed of appropriately.
- Stockpiles will be characterized for waste disposal as the excavation proceeds and will be separated according to the toxic properties of the investigation-derived waste.
- Excavated soil will be properly disposed of off site based on waste characterization results.
- Excavated areas will be filled with clean soil and compacted to avoid any surface depressions that could facilitate ponding of standing water.
- If necessary, the site will be graded to prevent surface drainage, erosion, and ponding of standing water near Site 23.

Off-site transportation of the excavated materials will be in accordance with CERCLA §121 (d)(3) and 40 CFR 300.440. These requirements will also apply to any additional removal sites that may be included in this TCRA as a result of CERCLA contaminant concentrations that exceed PRGs. In general, excavation will encompass the area identified as a magnetic anomaly during the PA (Figure 2). Before the removal action begins, the NAWS China Lake biologist will conduct a site visit to ensure that the desert tortoise will not be affected.

5.1.2 Contribution to Remedial Performance

All contamination will have been excavated, removed, treated, and disposed of appropriately to the maximum practical extent. If applicable, residual concentrations of COCs in soil will be evaluated in a risk assessment provided in the on-scene coordinator's report to be developed by the Navy after the proposed removal action.

5.1.3 Description of Alternative Technologies

CERCLA encourages treatment as a principal means of addressing threats from site-related contamination. The Navy proposes the following alternatives for Site 23:

- Alternative 1: Removal Action – Excavation, waste characterization, and off-site disposal. This alternative is appropriate because it removes the source of contamination in a timely manner, complies with federal and state regulations, and is cost effective.
- Alternative 2: Capping – This alternative is not appropriate because of its expense, the ongoing maintenance requirements, the potential for future migration, and the ongoing presence of highly contaminated materials at the site.

- Alternative 3: Ex Situ Thermal Desorption – This alternative is inappropriate based on the high level of contamination at Site 23 and the presence of alluvium that contains fine-grained soils. When silt and clay are heated, they emit dust that can interfere with the air emission equipment used to treat the vaporized contaminants. Air emissions during treatment of high levels of beta-BHC and the associated permitting are anticipated to be problematic.
- Alternative 4: Ex Situ Soil Washing – This alternative is inappropriate because beta-BHC and RDX are not exclusively associated with the fine-grained fraction of soils. Contamination is likely contained in both silt- and sand-sized fractions of soils at Site 23. Differentiating materials based on grain size is unlikely to effectively separate contaminated materials from uncontaminated materials. In addition, soil washing generally creates multiple waste streams that often require additional treatment.

Consequently, only one practicable removal action — excavation, waste characterization, and off-site disposal — is evaluated in this action memorandum. The paragraphs below explain how the preferred alternative meets the three selection criteria of effectiveness, implementability, and cost. The proposed removal action would effectively protect human health and the environment from COCs in soil by removing contaminated soil and disposing of the soil at an off-site facility while complying with the chemical-, location-, and action-specific ARARs identified in Tables 3 through 8 (following the Figures section).

Chemical-specific ARARs were identified for this TCRA (Table 3 and Table 4). The removal action will comply with location-specific ARARs by minimizing adverse effects to the surrounding environment and nearby historic properties (Table 5 and Table 6). Excavated soils would be sampled as they are removed and segregated into soil stockpiles, and control measures for fugitive dust emissions and storm water runoff would be implemented. These measures would promote compliance with action-specific ARARs for waste characterization and disposal (Table 7 and Table 8). The proposed removal action would provide effective short- and long-term reduction to exposure of COCs by removing contaminated soils from Site 23 as a TCRA. In the short term, worker exposure during the TCRA would be minimized through the proper use of engineering controls and personal protective equipment.

Over the long term, residual concentrations of COCs at the excavation site shown on Figures 2 and 3 would be below EPA Region IX residential PRGs and therefore would minimize exposure to COCs. This alternative does not present any technical or administrative constraints on implementability. This response action alternative has been successfully employed at other parcels at NAWS China Lake to protect human health and the environment.

The estimated cost of the proposed alternative is \$600,000.

5.1.4 Engineering Evaluation/Cost Analysis

A TCRA is necessary to address ecological risks posed by contaminants at Site 23, in accordance with 40 CFR Part 300.415(b)(2). An engineering evaluation and cost analysis is not applicable because the proposed action is a TCRA.

5.1.5 Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA, 42 U.S.C. Section 9621(d), as amended, states that remedial actions at CERCLA sites must attain (or the decision document must justify the waiver of) any federal or more stringent state environmental standards, requirements, criteria, or limitations determined to be legally applicable or relevant and appropriate. Although Section 121 of CERCLA does not itself expressly require that CERCLA removal actions comply with ARARs, EPA has promulgated a requirement in the NCP mandating that CERCLA removal actions:

“...shall, to the extent practicable considering the exigencies of the situation, attain applicable or relevant and appropriate requirements under federal environmental or state environmental or facility siting laws” (Title 40 CFR Part 300.415[j], 40 CFR §300.415[j]).

It is Navy policy to follow this requirement. Certain specified waivers may be used for removal actions, as is the case with remedial actions.

Applicable requirements are the cleanup standards, standards of control, and other substantive requirements, criteria, or limitation promulgated under federal or state law that specifically address the situation at a CERCLA site. The requirements are applicable if the jurisdictional prerequisites of the standards show a direct correspondence when objectively compared with the conditions at the site. An applicable federal requirement is an ARAR. An applicable state requirement is an ARAR only if it is more stringent than federal ARARs.

If the requirement is not legally applicable, then the requirement is evaluated to determine whether it is relevant and appropriate. Relevant and appropriate requirements are the cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal or state law that, while not applicable, address problems or situations similar to the circumstances of the proposed response action and are well suited to the conditions of the site (EPA 1991). A requirement must be determined to be both relevant and appropriate to be considered an ARAR.

The criteria for determining relevance and appropriateness are listed in 40 CFR Part 300.400(g)(2) and include the following:

- The purpose of the requirement and the purpose of the CERCLA action

- The medium regulated or affected by the requirement and the medium contaminated or affected at the CERCLA site
- The substances regulated by the requirement and the substances found at the CERCLA site
- The actions or activities regulated by the requirement and the response action contemplated at the CERCLA site
- Any variances, waivers, or exemptions of the requirement and their availability for the circumstances at the CERCLA site;
- The type of place regulated and the type of place affected by the release or CERCLA action
- The type and size of structure or facility regulated and the type and size of structure or facility affected by the release of contemplated by the CERCLA action
- Any consideration of use or potential use of affected resources in the requirement and the use or potential use of the affected resources at the CERCLA site

According to CERCLA ARARs guidance (EPA 1991), a requirement may be “applicable” or “relevant and appropriate,” but not both. ARARs must be identified on a site-specific basis and involve a two-part analysis: first, a determination whether a given requirement is applicable; then, if it is not applicable, a determination whether it is nevertheless both relevant and appropriate. Some regulations may be applicable or, if not applicable, may still be relevant and appropriate. When the analysis concludes that a requirement is both relevant and appropriate, compliance is required to the same degree as if it were applicable (EPA 1991).

Tables included in the action memorandum present each ARAR with an initial determination of its status (applicable, relevant and appropriate, or not an ARAR). The pertinent criteria for the determination of relevance and appropriateness were examined to decide whether the requirements addressed problems or situations sufficiently similar to the circumstances of the release or response action contemplated, and whether the requirement was well suited to the site.

A requirement must be substantive to constitute an ARAR. Therefore, only the substantive provisions of requirements identified as ARARs in this analysis are considered ARARs. Permits are considered procedural or administrative requirements. Provisions of generally relevant federal and state statutes and regulations that were deemed procedural or non-environmental, including permit requirements, are not considered ARARs. CERCLA § 121(e)(1), 42 U.S.C. § 9621(e)(1), states that “No Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely on-site, where such remedial action is selected and carried out in compliance with this section.” The term “on-site” is defined for this discussion as “the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action” (40 CFR Part 300.5).

Pursuant to EPA guidance (EPA 1991), ARARs are generally divided into three categories: chemical-, location-, and action-specific requirements. This classification was developed to aid in identifying ARARs; some ARARs do not fall precisely into one group or another. ARARs are identified for remedial actions where CERCLA authority is the basis for cleanup.

As the lead federal agency, the Navy has primary responsibility for identifying ARARs for the TCRA at Site 23. On October 19, 2004, the state submitted potential state ARARs for this TCRA. The Navy evaluated these potential state ARARs and included those state-identified requirements that the Navy agreed were ARARs for this TCRA in Table 4, Table 6, and Table 8. In addition, the requirements identified by the state that the Navy determined were not ARARs for this TCRA are presented in Appendix C.

5.1.6 Project Schedule

Removal of contaminated soils in the trench at Site 23 is anticipated to begin in April 2005 and is expected to be completed by May 2005.

5.2 ESTIMATED COSTS

The Navy has estimated the present worth cost of the removal action. The estimated costs include the direct and indirect capital costs of the proposed removal action. Post-removal site control costs are not anticipated for this TCRA. The items discussed below are considered capital costs.

- Direct Capital Costs
 - Construction costs
 - Equipment and material costs
 - Transport and disposal costs
 - Analytical costs
 - Contingency allowances
- Indirect Capital Costs
 - Engineering and design expenses
 - License and permit costs
 - Start-up and shakedown costs

Based on estimates from the previous TCRA for soil at similar sites, the estimated cost per bank cubic yard is \$230, including direct and indirect capital costs. Assuming that about 1,600 bank cubic yards will be removed initially and that subsequent excavations will increase that amount by 50 percent, the estimated present worth total cost for the proposed action is \$600,000 for 2,400 bank cubic yards.

6.0 EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If action should be delayed or not taken, ecological receptors will continue to be exposed to COCs in soil. Contamination will most likely spread from Site 23 to nearby areas via wind erosion, surface water runoff, and continued mobilization into groundwater. This spread of contamination would result in an increased health risk to the exposed local ecological populations.

If the action should be delayed or not taken, contamination will be allowed to continue to migrate, thereby potentially resulting in a greater volume of material to be remediated. This greater volume will result in an increase in costs for excavation, groundwater treatment, or disposal.

7.0 PUBLIC INVOLVEMENT

The Navy will prepare and distribute a fact sheet that describes contaminants at Site 23, risks to ecological receptors, and the proposed removal action. The Navy anticipates that a public meeting will be required to support this removal action. This meeting will most likely be held at a scheduled Restoration Advisory Board meeting and will occur within 60 days of the initiation of the proposed removal action. The action memorandum and other documents from the administrative record will be available for public review.

8.0 OUTSTANDING POLICY ISSUES

No outstanding policy issues are associated with Site 23.


9.0 RECOMMENDATION

To date, the Navy has not acquired evidence that would identify other potentially responsible parties (PRPs) at this site. However, information acquired in the future including, but not limited to, information acquired during implementation of this removal action or future response actions at the site, could result in the identification of other PRPs.

The action memorandum was written in accordance with current EPA and Navy guidance documents for time-critical removal actions under CERCLA. This action memorandum identifies and analyzes removal actions to address soils contaminated with pesticides and explosives at Site 23 at NAWS China Lake.

Based on the comparative analysis of the removal action alternatives completed in Section 5.1.3, the recommended removal action is excavation, characterization, and off-site disposal. This alternative is recommended because it provides a high degree of protection for the environment, does not involve significant administrative or technical constraints, and is not cost prohibitive.

This decision document represents the selected removal action for Site 23, NAWS China Lake, California, developed in accordance with CERCLA as amended and is not inconsistent with the NCP. This decision is based on the administrative record for the site.



Capt. Mark Storch
Captain USN

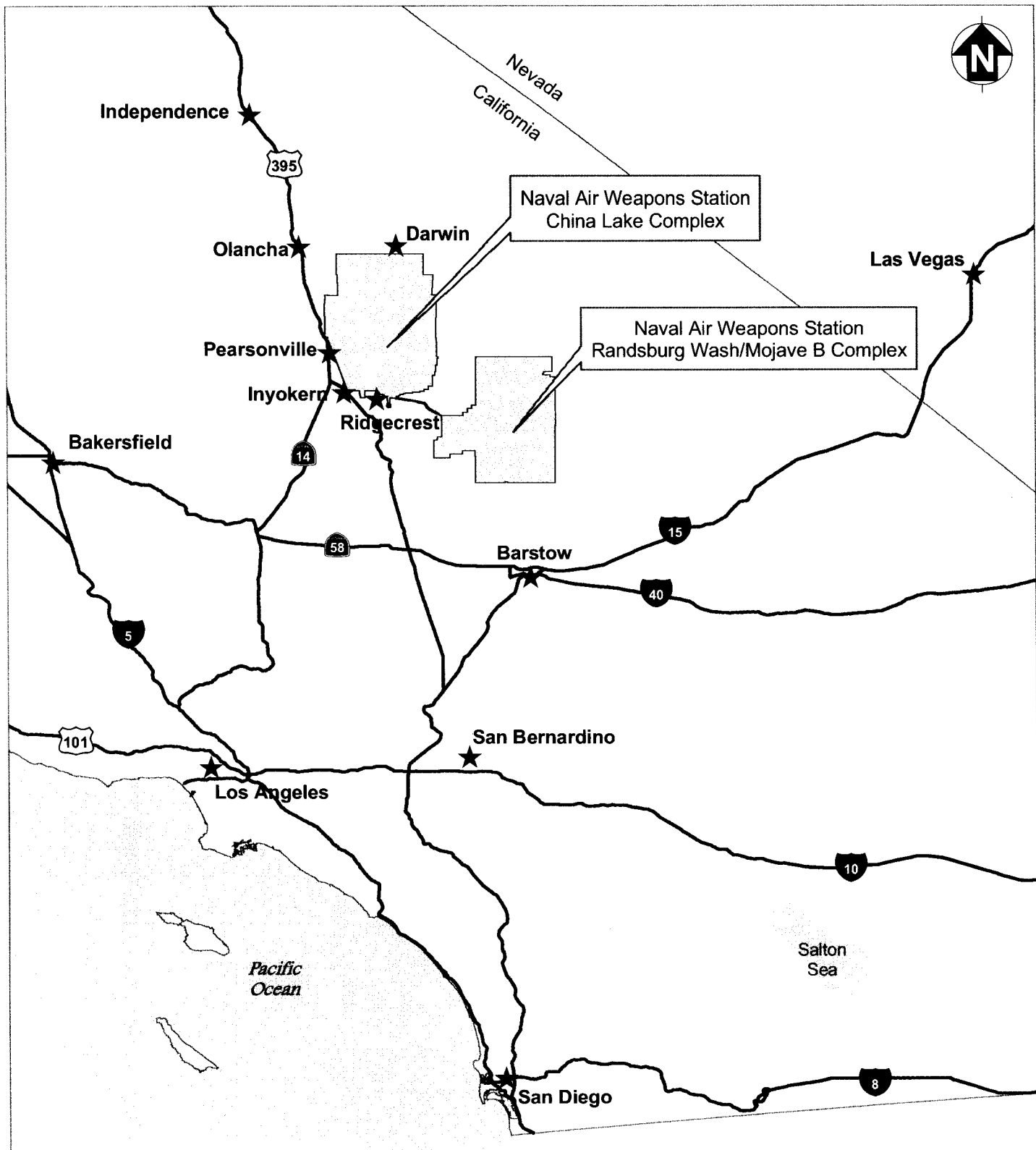


(Date)

10.0 REFERENCES

- Impact Area Groundwater Study Program. 2003. Army National Guard, Impact Area Groundwater Study Program
<http://www.groundwaterprogram.org/community/facts/rdx.pdf>
- McDonald. 2004. Telephone conversation between Gus Thrasher of SULLIVAN and Jim McDonald of NAWS China Lake Environmental Project Office on December 14, 2004.
- Naval Air Warfare Weapons Division. <http://www.nawcwpns.navy.mil/>
- Naval Air Weapons Station China Lake and Bureau of Land Management. 2004. "Final Environmental Impact Statement for Proposed Military Operational Increases and Implementation of Associated Comprehensive Land Use and Integrated Natural Resources Management Plans." February.
- Pesticides Trust. 1999. A briefing for UNISON prepared by the Pesticides Trust, London. On line at: http://www.headlice.org/lindane/health/toxicology/pops_repro.htm.
- PRC Environmental Management, Inc. (PRC) and Morrison Knudsen Corporation (MK). 1997. Naval Air Weapons Station China Lake, Preliminary Findings and Recommendations Technical Memorandum. Internal Draft. February.
- Tetra Tech EM Inc. (Tetra Tech). 1998. Background Soil Geophysical Characterization Technical Memorandum, NAWS China Lake. Draft Final. November.
- Tetra Tech. 2003. Draft Preliminary Assessment and Site Inspection for Sites 10, 19, 20, 23, 24, 25, 26, 30, 36, 40, and 77, Naval Air Weapons Station, China Lake, California. June
- Tetra Tech and Washington Group, Inc. 2002. Work Plan for Supplemental Preliminary Assessment at Sites 10, 19, 20, 23, 24, 25, 26, 30, 36, 40, and 77. Final. March.
- U.S. Environmental Protection Agency (EPA). 1990. Superfund Removal Procedures: Action Memorandum Guidance. Office of Solid Waste and Emergency Response (OSWER) Directive 9360.3-01. September.
- EPA. 1991. Superfund Removal Procedures: Guidance on the Consideration of ARARs during Removal Actions. OSWER Directive 9360.3-02. August.
- WESTEC Services, Inc. 1984. Initial Assessment Study of Naval Air Weapons Center, China Lake, California. November.

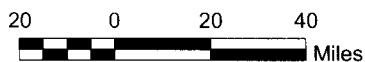
FIGURES

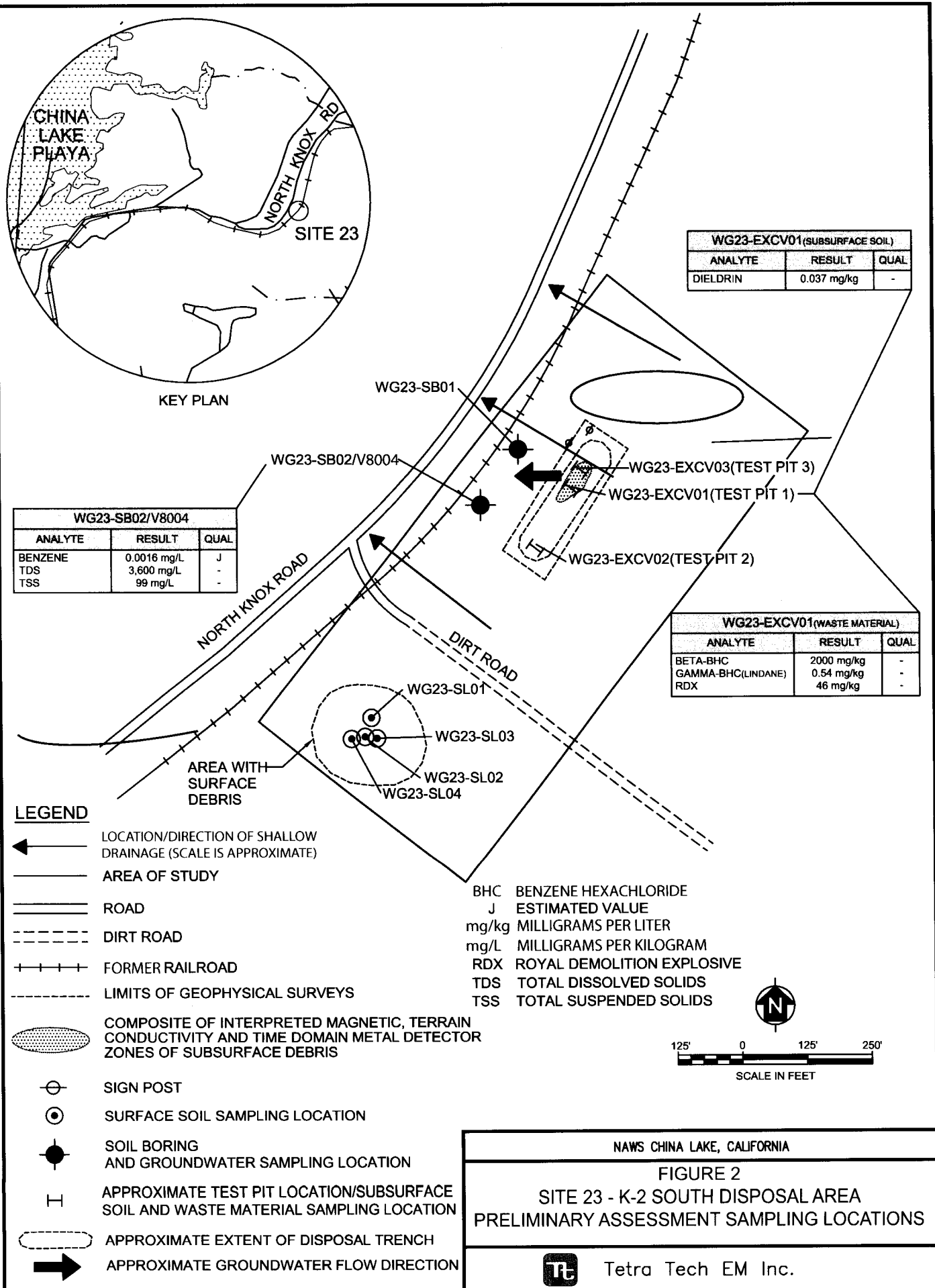


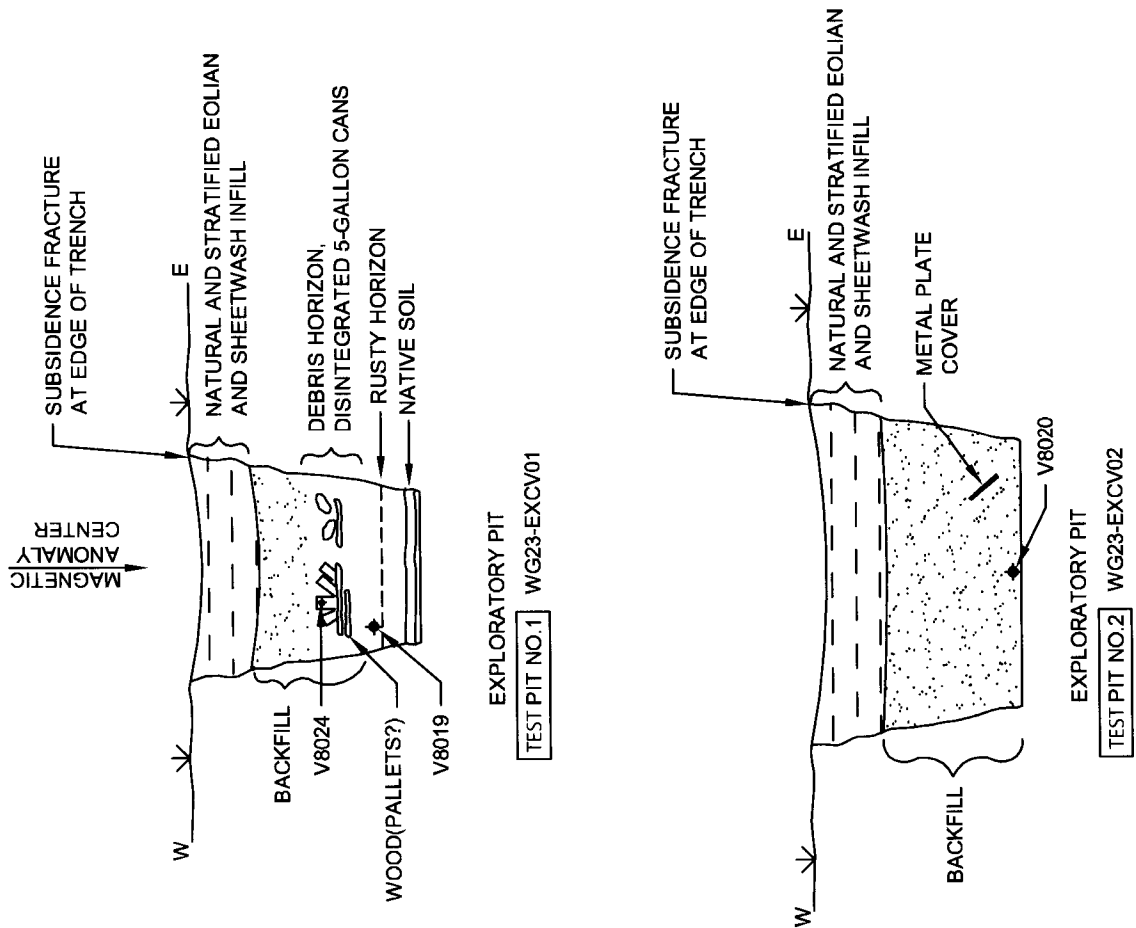
Naval Air Weapons Station China Lake
U.S. Navy Southwest Division, NAVFAC, San Diego

FIGURE 1 LOCATION MAP

Site 23 Time-Critical Removal Action
Action Memorandum







- ◆ SUBSURFACE PIT SOIL SAMPLE
- ◆ WHITE POWDER SAMPLE



NAWS CHINA LAKE, CALIFORNIA

FIGURE 3
PRELIMINARY ASSESSMENT
TEST PIT CROSS SECTIONS

Tt Tetra Tech EM Inc.

TABLES

**TABLE 1: SUMMARY OF MAXIMUM EXPLOSIVES AND PESTICIDE DETECTIONS
OBSERVED DURING PRELIMINARY ASSESSMENT OF IRP SITE 23**

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action
Naval Air Weapons Station, China Lake, California

Sample Point Name	Analyte	Maximum Detected Concentration (mg/kg) ^a	Residential PRG (mg/kg)	Industrial PRG (mg/kg)
WG23-EXCV01	RDX	46	4.4	16
	4,4'-DDD	0.027	2.4	100
	4,4'-DDE	0.16	1.7	7
	4,4'-DDT	0.051	1.7	7
	Endrin	0.34	18	180
	Dieldrin	0.037	0.03	0.11
	Alpha-BHC	0.054	0.09	0.36
	Beta-BHC	2000	0.32	1.3
	Gamma-BHC	0.54	0.44	1.7
	Chlordane	0.017	1.6	6.5
WG23-EXCV03	4,4'-DDE	0.0038	1.7	7
	4,4'-DDT	0.015	1.7	7
	Heptachlor Epoxide	0.0058	0.053	0.19
	Chlordane	0.0850	1.6	6.5
	Beta-BHC	0.013	0.32	1.3

Notes:

^a Exceedences of either residential or industrial PRGs are noted in bold

4,4'-DDD tetrachlorodiphenylethane

4,4'-DDE dichlorodiphenyldichloroethane

4,4'-DDT dichlorodiphenyl trichloroethane;

BHC benzene hexachloride

PRG Preliminary Remedial Goal

RDX Royal Demolition Explosive

TABLE 2: SPECIAL STATUS SPECIES POTENTIALLY OCCURRING AT SITE 23

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action
 Naval Air Weapons Station, China Lake, California

Species	Common Name (<i>Scientific Name</i>)	Status
Birds	Golden Eagle (<i>Aquila chrysaetos</i>)	CSC
	Swainson's Hawk (<i>Buteo swainsoni</i>)	ST
	Western Snowy Plover (<i>Charadrius alexandrinus nivosus</i>)	FT, CSC
	Burrowing Owl (<i>Athene cunicularia</i>)	CSC
	Willow Flycatcher (<i>Empidonax trailii</i>)	SE
	Southwestern Willow Flycatcher (<i>Empidonax trailii extimus</i>)	FE, SE
	Prairie Falcon (<i>Falco mexicanus</i>)	CSC
	Bald Eagle (<i>Haliaeetus leucocephalus</i>)	FT, SE
	Loggerhead Shrike (<i>Lanius ludovicianus</i>)	CSC
	Le Conte's Thrasher (<i>Toxostoma lecontei</i>)	CSC
	Bank Swallow (<i>Riparia riparia</i>)	ST
	Least Bell's Vireo (<i>Vireo bellii pusillus</i>)	SE, FE
Reptiles	Desert Tortoise (<i>Gopherus agassizii</i>)	FT, ST, CP
Mammals	Pallid Bat (<i>Antrozous pallidus</i>)	CSC
	Mohave Ground Squirrel (<i>Spermophilus mohavensis</i>)	ST
	American Badger (<i>Taxidea taxus</i>)	CSC
Plants	Shining Milk-vetch (<i>Astragalus lentiginosus</i> var. <i>micans</i>)	CSP
	Half-ring Milk-vetch (<i>Astragalus mojavensis</i> var. <i>hemigyris</i>)	CSP
	Gypsum linanthus (<i>Linanthus arenicola</i>)	CSP

Notes:

CP	California Department of Fish and Game Fully Protected or Protected
CSC	California Department of Fish and Game Species of Concern
CSP	California Native Plant Society Special Plant
FE	Federal Endangered Species
FT	Federal Threatened Species
IRP	Installation Restoration Program
SE	State of California Endangered Species
ST	State of California Threatened Species

Sources:

California Department of Fish and Game. 2004. California Natural Diversity Data Base. June 6. 9 quadrant search, based on Lone Butte quadrant.

Naval Air Weapons Station (NAWS). 2002. "Integrated Natural Resources Management Plan, Naval Weapons Station China Lake, California." Department of the Navy. Environmental Project Office, China Lake, California.

U.S. Fish and Wildlife Service. 2002. "Birds of Conservation Concern 2002." Division of Migratory Bird Management. Arlington, Virginia. December.

TABLE 3: FEDERAL CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Requirement	Prerequisite	Citation ^a	Preliminary ARAR Determination	Comments
Resource Conservation and Recovery Act (42 U.S.C. ch. 82, §§ 6901-6991[i]) ^b				
Defines RCRA hazardous waste. A solid waste is characterized as toxic, based on the maximum concentration limits	Waste	22 CCR §§ 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), 66261.100	Applicable	Applicable for determining whether the soil is RCRA hazardous. The Navy will make this determination at the time the waste is generated
Land disposal restrictions (LDR) prohibit disposal of hazardous waste unless treatment standards are met	Hazardous waste land disposal	22 CCR § 66268.1(f)	Applicable	Applicable if the soil is determined to be RCRA hazardous waste and will be disposed of on land
Generators of hazardous waste must determine if the RCRA hazardous waste needs to be treated prior to land disposal and must certify that the waste does or does not need to be treated prior to land disposal	RCRA hazardous waste	22 CCR § 66268.7(a)	Applicable	Applicable if the soil is determined to be RCRA hazardous waste and will be disposed of on land
Initial generators of hazardous waste must determine if the waste displays a hazardous characteristic and must determine the underlying hazardous constituents	RCRA hazardous waste	22 CCR § 66268.9	Applicable	Applicable if the soil is determined to be RCRA hazardous waste and will be disposed of on land
A prohibited RCRA hazardous waste may be disposed of on land only if it meets treatment standards	RCRA hazardous waste	22 CCR § 66268.40	Applicable	Applicable if the soil is determined to be RCRA hazardous waste and will be disposed of on land
Universal treatment standards used to comply with treatment standards	RCRA hazardous waste	22 CCR § 66268.48	Applicable	Applicable if the soil is determined to be RCRA hazardous waste and will be disposed of on land
Soil that is subject to RCRA LDRs must comply with alternative LDRs or the Universal Treatment Standards	RCRA hazardous waste	22 CCR § 66268.49	Applicable	Applicable if the soil is determined to be RCRA hazardous waste and will be disposed of on land

**TABLE 3: FEDERAL CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
(Continued)**

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Notes:

- a Only the substantive provisions of the requirements cited in this table are potential ARARs
- b Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as potential ARARs; specific potential ARARs follow each general heading, and only the substantive requirements of the specific citations are considered potential ARARs.

§	Section
ARAR	Applicable or relevant and appropriate requirement
CCR	California Code of Regulations
IRP	Installation Restoration Program
LDR	Land disposal restriction
RCRA	Resource Conservation and Recovery Act
U.S.C.	U.S. Code

TABLE 4: STATE CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Requirement	Prerequisite	Citation ^a	Preliminary ARAR Determination	Comments
Cal/EPA Department of Toxic Substances Control^b				
Definition of "non-RCRA state-regulated hazardous waste"	Waste	22 CCR §§ 66261.22(a)(3) and (4), 66261.24(a)(2)-(a)(8), 66261.101, 66261.3(a)(2)(C) or 66261.3(a)(2)(F)	Applicable	Applicable for any operation where waste is generated. The Navy will make this determination at the time the waste is generated
Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste^b				
Definitions of designated waste, nonhazardous waste, and inert waste	Waste	27 CCR §§ 20210, 20220, 20230	Applicable	Applicable for any operation where waste is generated. The Navy will make this determination at the time the waste is generated

Notes:

- a Only the substantive provisions of the requirements cited in this table are potential ARARs
- b Statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only the substantive requirement of the specific citations are considered potential ARARs

§	Section
ARAR	Applicable or relevant and appropriate requirement
Cal/EPA	California Environmental Protection Agency
CCR	California Code of Regulations
IRP	Installation Restoration Program
RCRA	Resource Conservation and Recovery Act

TABLE 5: FEDERAL LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
Endangered Species Act of 1973 (16 USC §§ 1531-1543)^b					
Habitat upon which endangered species or threatened species depend	Federal agencies may not jeopardize the continued existence of any listed species or cause the destruction or adverse modification of critical habitat. The Endangered Species Committee may grant an exemption for agency action if reasonable mitigation and enhancement measures such as propagation, translocation, and habitat acquisition and improvement are implemented.	Determination of effect upon endangered or threatened species or its habitat. Critical habitat upon which endangered species or threatened species depend.	16 U.S.C. §1536(a), (h)(1)(B)	Applicable	There is the potential for federally threatened and endangered species at Site 23. The Navy will have a biologist on-site during this TCRA to make sure that it will not adversely affect any potential habitat for or these threatened and endangered species.
Migratory bird area	Protects almost all species of native migratory birds in the US from unregulated "taking," which can include poisoning at hazardous waste sites.	Presence of migratory birds.	16 U.S.C. §703	Relevant and appropriate	This migratory Bird Treaty Act of 1972 is not applicable to Navy actions; however Executive Order Number 13186 requires each federal agency taking actions that have or are likely to have a measurable effect on migratory bird populations to develop and implement a memorandum of understanding with the US Fish and Wildlife Service (USFWS). The DoD and the USFWS are in the process of negotiating this MOU. In the meantime, the Migratory Bird Treaty act will be evaluated as relevant and appropriate for CERCLA response actions. The Navy will have a biologist on-site during this TCRA to make sure that it will not affect any migratory birds.

**TABLE 5: FEDERAL LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
(Continued)**

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Notes:

- a Only the substantive provisions of the requirements cited in this table are ARARs
- b statutes and policies, and their citations, are provided as headings to identify general categories of ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as ARARs; specific ARARs are addressed in the table below each general heading; only the substantive requirement of the specific citations are considered ARARs

§	Section
ARAR	Applicable or relevant and appropriate requirement
IRP	Installation Restoration Program
MOU	Memorandum of Understanding
TCRA	Time Critical Removal Action
U.S.C	United States Code
USFWS	United States Fish and Wildlife Service

TABLE 6: STATE LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Location	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
California Endangered Species Act (Cal. Fish & Game Code §§ 2050-2116)^b					
Endangered species habitat	No person shall import, export, take, possess, or sell any endangered or threatened species or part or product thereof.	Threatened or endangered species determination on or before January 1, 1985, or a candidate species with proper notification.	Cal. Fish & Game Code § 2080	Relevant and Appropriate	It is the Navy's position that the requisite federal sovereign immunity waiver does not exist to authorize applicability of this Act. Nevertheless, the Navy has determined that this section is relevant and appropriate because of the potential presence of the Mojave ground squirrel. The Navy's TCRA will comply with this ARAR.

Notes:

- a Only the substantive provisions of the requirements cited in this table are ARARs
- b statutes and policies, and their citations, are provided as headings to identify general categories of ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as ARARs; specific ARARs are addressed in the table below each general heading; only the substantive requirement of the specific citations are considered ARARs§ Section

ARAR Applicable or relevant and appropriate requirement

IRP Installation Restoration Program

TABLE 7: FEDERAL ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Action	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
Resource Conservation and Recovery Act (42 U.S.C., Chapter 82, §§ 6901-6991[i]) ^b					
On-site waste generation	Person who generates waste shall determine if that waste is a hazardous waste	Generator of waste	22 CCR §§ 66262.10(a), 66262.11.	Applicable	Applicable for any operation where hazardous waste is generated. The Navy will make this determination will be made at the time the wastes are generated
On-site waste generation	Waste shall be analyzed to determine whether it is hazardous	Generator of waste	22 CCR § 66264.13(a) and (b).	Applicable	Applicable for any operation where hazardous waste is generated. The Navy will make this determination will be made at the time the wastes are generated
Off-site disposal	Manifest requirements.	Off-site disposal of RCRA hazardous waste	22 CCR §§66262.20-66262.23	Applicable	Applicable if the Navy determines that the soil generated onsite is RCRA hazardous waste
Off-site disposal	Packaging, labeling, marking, and placarding requirements	Off-site disposal of RCRA hazardous waste	22 CCR §§ 66262.30, 66262.31, 66262.32, 66262.33	Applicable	Applicable if the Navy determines that the soil generated onsite is RCRA hazardous waste
Temporary soil storage	Allows generators to accumulate solid remediation waste in a U.S. EPA-designated pile for storage only, up to 2 years, during remedial operations without triggering LDRs	Hazardous remediation waste temporarily stored in staging piles for subsequent management or treatment	40 CFR § 264.554(a), (d), (e), (f), (g), (h), (i)	Relevant and appropriate	The Navy will temporarily stage the soil prior to off-site disposal.

**TABLE 7: FEDERAL ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
(Continued)**

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Action	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
Clean Air Act 42 U.S.C. §§ 7401-7671)^b					
Excavating soil	A person shall take every reasonable precaution to minimize fugitive dust emissions, and shall not cause or allow particulate matter to exceed 100 micrograms per cubic meter except under certain wind conditions.	Potential emission of fugitive dust from any construction activity.	MOJQAQMD Rule 403(b), (c), and (e).	Applicable	Applicable for the excavation of soil.

Notes:

a Only the substantive provisions of the requirements cited in this table are ARARs

b Statutes and policies, and their citations, are provided as headings to identify general categories of ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as ARARs; specific ARARs follow each general heading, and only the substantive requirements of the specific citations are considered ARARs.

§	Section
ARAR	Applicable or relevant and appropriate requirement
CCR	California Code of Regulations
CFR	Code of Federal Regulations
IRP	Installation Restoration Program
LDR	Land disposal restriction
MOJQAQMD	Mojave Desert Air Quality Management District
RCRA	Resource Conservation and Recovery Act
U.S.C.	United States. Code

TABLE 8: STATE ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Action	Requirement	Prerequisite	Citation ^a	ARAR Determination	Comments
State Water Resources Control Board^b					
Excavation and temporary storage of soil	Actions taken by or at the direction of public agencies to clean up or abate unintentional or unauthorized releases of waste or pollutants are exempt from Title 27 requirements provided that wastes removed from the immediate place of release shall be discharged according to Article 2, Subchapter 2, Chapter 3, Subdivision 1.	Action taken by public agency to cleanup unintentional or unauthorized release	27 CCR § 20090(d)	Relevant and appropriate	The Navy will temporarily store the soil in a RCRA staging pile in the immediate place of release prior to off-site disposal. The Navy will dispose of the soil at an appropriate waste disposal facility.
Disposal of waste	Requires that designated waste as defined at Cal. Water Code § 13173 be discharged to Class I or Class II waste management units	Discharges of designated waste after 18 July 1997 to land for treatment, storage, or disposal	27 CCR § 20210	Applicable	Applicable for any operation where waste is generated. The Navy will make this determination when the wastes are generated
Disposal of waste	Requires that nonhazardous solid waste as defined at 27 CCR § 20220(a) be discharged to a classified waste management unit	Discharge of nonhazardous solid waste after 18 July 1997 to land for treatment, storage, or disposal.	27 CCR § 20220(b), (c), and (d)	Applicable	Applicable for any operation where waste is generated. The Navy will make this determination when the wastes are generated
Disposal of waste	Inert waste as defined at 27 CCR § 20230(a) need not be discharged at a classified unit	Applies to discharges of inert waste to land after 18 July 1997 for treatment, storage, or disposal.	27 CCR § 20230(b).	Applicable	Applicable for any operation where waste is generated. The Navy will make this determination when the wastes are generated

**TABLE 8: STATE ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
(Continued)**

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Notes:

- a Only the substantive provisions of the requirements cited in this table are ARARs
- b statutes and policies, and their citations, are provided as headings to identify general categories of ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as ARARs; specific ARARs are addressed in the table below each general heading; only the substantive requirement of the specific citations are considered ARARs

§ Section

- ARAR Applicable or relevant and appropriate requirement
- CCR California Code of Regulations Cal/EPA California Environmental Protection Agency
- IRP Installation Restoration Program
- RCRA Resource Conservation and Recovery Act

APPENDIX A
PRELIMINARY ASSESSMENT ANALYTICAL DATA

- Table A-1: Preliminary Assessment Analytical Data

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-EXCV01	V8024	SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	RDX	0.4	46	mg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	2-NITROTOLUENE	0.4	0.22	mg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	3-NITROTOLUENE	0.4	0.28	mg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	4-NITROTOLUENE	0.4	1.2	mg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	1,3,5-TNB	0.4	0.4	mg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	1,3-DNB	0.4	0.4	mg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	2,4,6-TNT	0.4	0.4	mg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	2,4-DNT	0.4	0.4	mg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	2,6-DNT	0.4	0.4	mg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	2-AM-4,6-DNT	0.4	0.4	mg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	4-AM-2,6-DNT	0.4	0.4	mg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	HMX	0.4	0.4	mg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	NITROBENZENE	0.4	0.4	mg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	TETRYL	0.4	0.4	mg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PCB	SW8082	PCB-1016	1000	1000	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PCB	SW8082	PCB-1221	2100	2100	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PCB	SW8082	PCB-1232	1000	1000	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PCB	SW8082	PCB-1242	1000	1000	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PCB	SW8082	PCB-1248	1000	1000	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PCB	SW8082	PCB-1254	1000	1000	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PCB	SW8082	PCB-1260	1000	1000	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PCB	SW8082	4,4'-DDE	100	160	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ALPHA-BHC	53	54	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	BETA-BHC	53	2000000	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ENDRIN	100	340	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	GAMMA-BHC (LINDANE)	53	540	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	4,4'-DDD	100	100	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	4,4'-DDT	100	100	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ALDRIN	53	53	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ALPHA-CHLORDANE	53	53	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	DELTA-BHC	53	53	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	DIELDRIN	100	100	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ENDOSULFAN I	53	53	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ENDOSULFAN II	100	100	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ENDOSULFAN SULFATE	100	100	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ENDRIN ALDEHYDE	100	100	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ENDRIN KETONE	100	100	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	GAMMA-CHLORDANE	53	53	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	HEPTACHLOR	53	53	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	HEPTACHLOR EPOXIDE	53	53	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	METHOXYCHLOR	530	530	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	TOXAPHENE	5300	5300	µg/kg	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	1,1,2,2-TETRACHLOROETHANE	0	12000	µg/kg	Y
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	1,1,2-TRICHLOROETHANE	0	5700	µg/kg	Y
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	1,2,4-TRICHLOROETHANE	10000	10000	µg/kg	N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-EXCV01 (cont.)	V8024 (cont.)	SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	1,2-DICHLOROBENZENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	1,3-DICHLOROBENZENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	1,4-DICHLOROBENZENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2,4,5-TRICHLOROPHENOL	26000	26000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2,4,6-TRICHLOROPHENOL	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2,4-DICHLOROPHENOL	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2,4-DIMETHYLPHENOL	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2,4-DINITROPHENOL	26000	26000	UJ	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2,4-DINITROTOLUENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2,6-DINITROTOLUENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2-CHLORONAPHTHALENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2-CHLOROPHENOL	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2-METHYLNAPHTHALENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2-METHYLPHENOL	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2-NITROANILINE	26000	26000	UJ	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2-NITROPHENOL	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	3,3'-DICHLOROBENZIDINE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	3-NITROANILINE	26000	26000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4(1H)-PYRIMIDINONE, 6-METHYL-2	0	60000	NJ	Y
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4,6-DINITRO-2-METHYLPHENOL	26000	26000	R	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4-BROMOPHENYLPHENYLETHER	10000	10000	R	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4-CHLORO-3-METHYLPHENOL	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4-CHLOROANILINE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4-CHLOROPHENYLPHENYLETHER	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4-METHYLPHENOL	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4-NITROANILINE	26000	26000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4-NITROPHENOL	26000	26000	UJ	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	ACENAPHTHENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	ANTHRACENE	10000	10000	R	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BENZO(A)ANTHRACENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BENZO(A)PYRENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BENZO(B)FLUORANTHENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BENZO(G,H,I)PERYLENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BENZO(K)FLUORANTHENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BIS(2-CHLOROETHOXY)METHANE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BIS(2-CHLOROETHYL)ETHER	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BIS(2-CHLOROISOPROPYL)ETHER	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BIS(2-ETHYLHEXYL)PHTHALATE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BUTYLBENZYLPHTHALATE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	CARBAZOLE	10000	10000	R	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	CHRYSENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	DIBENZ(A,H)ANTHRACENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	DIBENZOFURAN	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	DIETHYLPHTHALATE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	DIMETHYLPHTHALATE	10000	10000	U	N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-EXCV01 (cont.)	V8024 (cont.)	SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	DIMPYLATE	0	140000	NJ	Y
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	DI-N-BUTYLPHTHALATE	10000	10000	R	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	DI-N-OCTYLPHTHALATE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	FLUORANTHENE	10000	10000	R	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	FLUORENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROBENZENE	10000	10000	R	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROBUTADIENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROETHANE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	HEXADECANAMIDE	0	5900	NJ	Y
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	INDENO(1,2,3-CD)PYRENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	ISOPHORONE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	NAPHTHALENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	NITROBENZENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	N-NITROSO-DI-N-PROPYLAMINE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	N-NITROSODIPHENYLAMINE (1)	10000	10000	R	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	PENTACHLOROPHENOL	26000	26000	R	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	PHENANTHRENE	10000	10000	R	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	PHENOL	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	PYRENE	10000	10000	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	ALUMINUM	46.1	560		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	CALCIUM	70	316000		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	MAGNESIUM	82.3	2220		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	ZINC	2.97	27.2		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	ARSENIC	0.217	0.806	J	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	BARIUM	1.28	8.29	J	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	CHROMIUM	6.32	7.11	J	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	IRON	15.7	2380	J	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	LEAD	0.179	1.74	J	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	MANGANESE	1.94	25.5	J	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	SODIUM	72.2	541	J	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	VANADIUM	4.51	5.18	J	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	ANTIMONY	21.7	21.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	BERYLLIUM	1.22	1.22	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	CADMIUM	3.73	3.73	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	COBALT	7.12	7.12	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	COPPER	4.86	4.86	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	MERCURY	0.0175	0.0175	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	MOLYBDENUM	7.6	7.6	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	NICKEL	5.66	5.66	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	POTASSIUM	737	737	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	SELENIUM	0.293	0.293	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	SILVER	6.47	6.47	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	THALLIUM	0.314	0.314	U	N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-EXCV01 (cont.)	V8024 (cont.)	SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	RDX	0.4	2.2	J mg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	1,3,5-TNB	0.4	0.4	U mg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	1,3-DNB	0.4	0.4	U mg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	2,4,6-TNT	0.4	0.4	U mg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	2,4-DNT	0.4	0.4	U mg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	2,6-DNT	0.4	0.4	U mg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	2-AM-4,6-DNT	0.4	0.4	U mg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	2-NITROTOLUENE	0.4	0.4	U mg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	3-NITROTOLUENE	0.4	0.4	U mg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	4-AM-2,6-DNT	0.4	0.4	U mg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	4-NITROTOLUENE	0.4	0.4	U mg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	NITROBENZENE	0.4	0.4	U mg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	TETRYL	0.4	0.4	U mg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	HMX	0.4	0.4	U mg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PCB	SW8082	PCB-1016	35	35	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PCB	SW8082	PCB-1221	71	71	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PCB	SW8082	PCB-1232	35	35	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PCB	SW8082	PCB-1242	35	35	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PCB	SW8082	PCB-1248	35	35	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PCB	SW8082	PCB-1254	35	35	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PCB	SW8082	PCB-1260	35	35	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	4,4'-DDE	3.5	7.6	µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ALPHA-CHLORDANE	1.8	3.5	µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	DIELDRIN	3.5	37	µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	GAMMA-CHLORDANE	1.8	13	µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	4,4'-DDD	3.5	27	J µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	4,4'-DDT	3.5	51	J µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ALPHA-BHC	1.8	0.73	J µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ENDRIN	3.5	3.1	J µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	GAMMA-BHC (LINDANE)	1.8	1.4	J µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ALDRIN	1.8	1.8	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	BETA-BHC	1.8	1.8	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	DELTA-BHC	1.8	1.8	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ENDOSULFAN I	1.8	1.8	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ENDOSULFAN II	3.5	3.5	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ENDOSULFAN SULFATE	3.5	3.5	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ENDRIN ALDEHYDE	3.5	3.5	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ENDRIN KETONE	3.5	3.5	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	HEPTACHLOR	1.8	1.8	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	HEPTACHLOR EPOXIDE	1.8	1.8	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	METHOXYCHLOR	18	18	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	TOXAPHENE	180	180	U µg/kg	N
		SOIL	10 to 10.5	NA	05/08/02	RADIO	714R7	U-232	0.059	2.71	pCi/g	N
		SOIL	10 to 10.5	NA	05/08/02	RADIO	714R7	U-233/234	0.043	0.56	pCi/g	N
		SOIL	10 to 10.5	NA	05/08/02	RADIO	714R7	U-238	0.041	0.47	pCi/g	N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-EXCV01 (cont.)	V8024 (cont.)	SOIL	10 to 10.5	NA	05/08/02	RADIO	714R7	U-235	0.031	0.039	J	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	1,2,4-TRICHLOROBENZENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	1,2-DICHLOROBENZENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	1,3-DICHLOROBENZENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	1,4-DICHLOROBENZENE	1700	1700	U	N
WG23-EXCV01	V8019	SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	2,4,5-TRICHLOROPHENOL	4400	4400	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	2,4,6-TRICHLOROPHENOL	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	2,4-DICHLOROPHENOL	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	2,4-DIMETHYLPHENOL	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	2,4-DINITROPHENOL	4400	4400	UJ	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	2,4-DINITROTOLUENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	2,6-DINITROTOLUENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	2-CHLORONAPHTHALENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	2-CHLOROPHENOL	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	2-METHYLNAPHTHALENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	2-METHYLPHENOL	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	2-NITROANILINE	4400	4400	UJ	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	2-NITROPHENOL	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	3,3'-DICHLOROBENZIDINE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	3-NITROANILINE	4400	4400	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	4(1H)-PYRIMIDINONE, 6-METHYL-	0	3200	NJ	Y
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	4,6-DINITRO-2-METHYLPHENOL	4400	4400	UJ	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	4-BROMOPHENYLENETHYLETHYR	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	4-CHLORO-3-METHYLPHENOL	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	4-CHLOROANILINE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	4-CHLOROPHENYLENETHYLETHYR	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	4-METHYLPHENOL	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	4-NITROANILINE	4400	4400	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	4-NITROPHENOL	4400	4400	UJ	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	ACENAPHTHENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	ANTHRACENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	BENZO(A)ANTHRACENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	BENZO(A)PYRENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	BENZO(B)FLUORANTHENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	BENZO(G,H,I)PERYLENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	BENZO(K)FLUORANTHENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	BIS(2-CHLOROETHOXY)METHANE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	BIS(2-CHLOROETHYL)ETHER	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	BIS(2-CHLOROISOPROPYL)ETHER	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	BIS(2-ETHYLHEXYL)PHTHALATE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	BUTYLBENZYL PHTHALATE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	CARBAZOLE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	CHRYSENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	DIBENZ(A,H)ANTHRACENE	1700	1700	U	N
			10 to 10.5	NA	05/08/02	SVOA	SW8270C	DIBENZOFURAN	1700	1700	U	N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-EXCV01	V8019	SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	DIETHYLPHTHALATE	1700	1700	U	N
(cont.)	(cont.)	SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	DIMETHYLPHTHALATE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	DIMPYLATE	0	78000	NJ	Y
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	DI-N-BUTYLPHTHALATE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	DI-N-OCTYLPHTHALATE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	FLUORANTHENE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	FLUORENE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROBENZENE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROBUTADIENE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROETHANE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	INDENO(1,2,3-CD)PYRENE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	ISOPHORONE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	NAPHTHALENE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	NITROBENZENE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	N-NITROSO-DI-N-PROPYLAMINE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	N-NITROSODIPHENYLAMINE (1)	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	PENTACHLOROPHENOL	4400	4400	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	PHENANTHRENE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	PHENOL	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	PYRENE	1700	1700	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	ALUMINUM	4.75	5060	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	ANTIMONY	2.23	2.23	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	ARSENIC	0.223	2.65	J	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	BARIUM	0.131	41.9	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	BERYLLIUM	0.125	0.125	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	CADMIUM	0.383	0.383	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	CALCIUM	7.2	22400	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	CHROMIUM	0.65	3.51	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	COBALT	0.732	3.25	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	COPPER	0.5	11.8	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	IRON	1.62	8260	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	LEAD	0.184	4.9	J	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	MAGNESIUM	8.47	3410	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	MANGANESE	0.199	106	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	MERCURY	0.018	0.018	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	MOLYBDENUM	0.782	0.782	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	NICKEL	0.583	5.65	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	POTASSIUM	75.8	2370	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	SELENIUM	0.302	0.302	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	SILVER	0.665	0.665	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	SODIUM	7.42	685	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	THALLIUM	0.323	0.323	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	VANADIUM	0.464	12.7	U	N
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	ZINC	0.305	12.3	U	N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-EXCV01 (cont.)	V8019 (cont.)	SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	TOLUENE	10	2.9	J	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	1,1,1-TRICHLOROETHANE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	1,1,2,2-TETRACHLOROETHANE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	1,1,2-TRICHLOROETHANE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	1,1-DICHLOROETHANE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	1,1-DICHLOROETHENE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	1,2-DICHLOROETHANE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	1,2-DICHLOROPROPANE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	2-BUTANONE	20	20	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	2-HEXANONE	20	20	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	4-METHYL-2-PENTANONE	20	20	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	BENZENE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	BROMODICHLOROMETHANE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	BROMOFORM	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	BROMOMETHANE	20	20	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CARBON DISULFIDE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CARBON TETRACHLORIDE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CHLOROBENZENE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CHLOROETHANE	20	20	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CHLOROFORM	10	10	U	µg/kg
WG23-EXCV02	V8020	SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CHLOROMETHANE	20	20	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CIS-1,2-DICHLOROETHENE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CIS-1,3-DICHLOROPROPENE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	DIBROMOCHLOROMETHANE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	ETHYLBENZENE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	M/P-XYLENES	20	20	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	METHYLENE CHLORIDE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	O-XYLENE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	STYRENE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	TETRACHLOROETHYLENE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	TRANS-1,2-DICHLOROETHENE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	TRANS-1,3-DICHLOROPROPENE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	TRICHLOROETHENE	10	10	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	VINYL CHLORIDE	20	20	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	ACETONE	20	37	UJ	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	1,3,5-TNB	0.4	0.4	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	1,3-DNB	0.4	0.4	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	2,4,6-TNT	0.4	0.4	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	2,4-DNT	0.4	0.4	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	2,6-DNT	0.4	0.4	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	2-AM-4,6-DNT	0.4	0.4	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	2-NITROTOLUENE	0.4	0.4	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	3-NITROTOLUENE	0.4	0.4	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	4-AM-2,6-DNT	0.4	0.4	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	4-NITROTOLUENE	0.4	0.4	U	mg/kg

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-EXCV02	V8020	SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	HMX	0.4	0.4	U	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	NITROBENZENE	0.4	0.4	U	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	RDX	0.4	0.4	U	N
		SOIL	10 to 10.5	NA	05/08/02	EXP	SW8330	TETRYL	0.4	0.4	U	N
		SOIL	10 to 10.5	NA	05/08/02	PCB	SW8082	PCB-1016	33	33	U	N
		SOIL	10 to 10.5	NA	05/08/02	PCB	SW8082	PCB-1221	68	68	U	N
		SOIL	10 to 10.5	NA	05/08/02	PCB	SW8082	PCB-1232	33	33	U	N
		SOIL	10 to 10.5	NA	05/08/02	PCB	SW8082	PCB-1242	33	33	U	N
		SOIL	10 to 10.5	NA	05/08/02	PCB	SW8082	PCB-1248	33	33	U	N
		SOIL	10 to 10.5	NA	05/08/02	PCB	SW8082	PCB-1254	33	33	U	N
		SOIL	10 to 10.5	NA	05/08/02	PCB	SW8082	PCB-1260	33	33	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	4,4'-DDD	3.3	3.3	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	4,4'-DDE	3.3	3.3	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	4,4'-DDT	3.3	3.3	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ALDRIN	1.7	1.7	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ALPHA-BHC	1.7	1.7	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ALPHA-CHLORDANE	1.7	1.7	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	BETA-BHC	1.7	1.7	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	DELTA-BHC	1.7	1.7	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	DIELDRIN	3.3	3.3	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ENDOSULFAN I	1.7	1.7	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ENDOSULFAN II	3.3	3.3	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ENDOSULFAN SULFATE	3.3	3.3	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ENDRIN	3.3	3.3	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ENDRIN ALDEHYDE	3.3	3.3	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	ENDRIN KETONE	3.3	3.3	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	GAMMA-BHC (LINDANE)	1.7	1.7	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	GAMMA-CHLORDANE	1.7	1.7	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	HEPTACHLOR	1.7	1.7	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	HEPTACHLOR EPOXIDE	1.7	1.7	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	METHOXYCHLOR	17	17	U	N
		SOIL	10 to 10.5	NA	05/08/02	PEST	SW8081A	TOXAPHENE	170	170	U	N
		SOIL	10 to 10.5	NA	05/08/02	RADIO	714R7	U-232	0.072	2.56		N
		SOIL	10 to 10.5	NA	05/08/02	RADIO	714R7	U-233/234	0.045	0.58		N
		SOIL	10 to 10.5	NA	05/08/02	RADIO	714R7	U-238	0.033	0.6		N
		SOIL	10 to 10.5	NA	05/08/02	RADIO	714R7	U-235	0.035	0.018	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	1,1,2,2-TETRACHLOROETHANE	0	350	NJ	Y
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	1,1,2-TRICHLOROETHANE	0	180	NJ	Y
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	1,2,4-TRICHLOROBENZENE	330	330	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	1,2-DICHLOROBENZENE	330	330	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	1,3-DICHLOROBENZENE	330	330	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	1,4-DICHLOROBENZENE	330	330	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	2,4,5-TRICHLOROPHENOL	840	840	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	2,4,6-TRICHLOROPHENOL	330	330	U	N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	2,4-DICHLOROPHENOL	330	330	U	N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-EXCV02 (cont.)	V8020 (cont.)	SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	2,4-DIMETHYLPHENOL	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	2,4-DINITROPHENOL	840	840	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	2,4-DINITROTOLUENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	2,6-DINITROTOLUENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	2-CHLORONAPHTHALENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	2-CHLOROPHENOL	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	2-METHYLNAPHTHALENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	2-METHYLPHENOL	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	2-NITROANILINE	840	840	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	2-NITROPHENOL	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	3,3'-DICHLOROBENZIDINE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	3-NITROANILINE	840	840	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	4,6-DINITRO-2-METHYLPHENOL	840	840	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	4-BROMOPHENYLPHENYLETHER	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	4-CHLORO-3-METHYLPHENOL	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	4-CHLOROANILINE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	4-CHLOROPHENYLPHENYLETHER	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	4-METHYLPHENOL	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	4-NITROANILINE	840	840	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	4-NITROPHENOL	840	840	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	ACENAPHTHENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	ANTHRACENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	BENZO(A)ANTHRACENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	BENZO(A)PYRENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	BENZO(B)FLUORANTHENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	BENZO(G,H,I)PERYLENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	BENZO(K)FLUORANTHENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	BIS(2-CHLOROETHOXY)METHANE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	BIS(2-CHLOROETHYL)ETHER	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	BIS(2-CHLOROISOPROPYL)ETHER	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	BIS(2-ETHYLHEXYL)PHTHALATE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	BUTYL BENZYL PHTHALATE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	CARBAZOLE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	CHRYSENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	DIBENZO(A,H)ANTHRACENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	DIBENZOFURAN	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	DIETHYL PHTHALATE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	DIMETHYL PHTHALATE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	DI-N-BUTYL PHTHALATE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	DI-N-OCTYL PHTHALATE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	FLUORANTHENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	FLUORENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROBENZENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROBUTADIENE	330	330	U	µg/kg N
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	330	330	U	µg/kg N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-EXCV02 (cont.)	V8020 (cont.)	SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROETHANE	330	330	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	INDENO(1,2,3-CD)PYRENE	330	330	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	ISOPHORONE	330	330	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	NAPHTHALENE	330	330	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	NITROBENZENE	330	330	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	N-NITROSO-DI-N-PROPYLAMINE	330	330	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	N-NITROSODIPHENYLAMINE (1)	330	330	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	PENTACHLOROPHENOL	840	840	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	PHENANTHRENE	330	330	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	PHENOL	330	330	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	SVOA	SW8270C	PYRENE	330	330	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	ALUMINUM	4.53	5440	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	ANTIMONY	2.12	2.12	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	ARSENIC	0.213	2.51	J	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	BARIUM	0.125	50.4		mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	BERYLLIUM	0.119	0.119	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	CADMIUM	0.366	0.366	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	CALCIUM	6.86	6000		mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	CHROMIUM	0.62	3.64		mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	COBALT	0.698	3.87		mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	COPPER	0.477	13.1		mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	IRON	1.54	6860		mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	LEAD	0.176	1.62	J	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	MAGNESIUM	8.07	3790		mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	MANGANESE	0.19	110		mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	MERCURY	0.0172	0.0172	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	MOLYBDENUM	0.745	0.745	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	NICKEL	0.556	7.18		mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	POTASSIUM	72.3	2670		mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	SELENIUM	0.288	0.288	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	SILVER	0.634	0.634	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	SODIUM	7.08	377		mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	THALLIUM	0.308	0.308	U	mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	VANADIUM	0.442	14.1		mg/kg
		SOIL	10 to 10.5	NA	05/08/02	TMETAL	SW7471A	ZINC	0.291	10.7		mg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	1,1,1-TRICHLOROETHANE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	1,1,2,2-TETRACHLOROETHANE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	1,1-DICHLOROETHANE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	1,1-DICHLOROETHENE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	1,2-DICHLOROETHANE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	1,2-DICHLOROPROPANE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	2-BUTANONE	19	19	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	2-HEXANONE	19	19	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	4-METHYL-2-PENTANONE	19	19	U	µg/kg

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-EXCV02 (cont.)	V8020	SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	ACETONE	19	29	UJ	N
	(cont.)	SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	BENZENE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	BROMODICHLOROMETHANE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	BROMOFORM	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	BROMOMETHANE	19	19	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CARBON DISULFIDE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CARBON TETRACHLORIDE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CHLOROBENZENE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CHLOROETHANE	19	19	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CHLOROFORM	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CHLOROMETHANE	19	19	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CIS-1,2-DICHLOROETHENE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	CIS-1,3-DICHLOROPROPENE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	DIBROMOCHLOROMETHANE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	ETHYLBENZENE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	M/P-XYLENES	19	19	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	METHYLENE CHLORIDE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	O-XYLENE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	STYRENE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	TETRACHLOROETHYLENE	9.6	9.6	U	µg/kg
WG23-EXCV03	V8021	SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	TOLUENE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	TRANS-1,2-DICHLOROETHENE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	TRANS-1,3-DICHLOROPROPENE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	TRICHLOROETHENE	9.6	9.6	U	µg/kg
		SOIL	10 to 10.5	NA	05/08/02	VOA	SW8260B	VINYL CHLORIDE	19	19	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	1,3,5-TNB	0.4	0.4	U	mg/kg
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	1,3-DNB	0.4	0.4	U	mg/kg
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	2,4,6-TNT	0.4	0.4	U	mg/kg
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	2,4-DNT	0.4	0.4	U	mg/kg
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	2,6-DNT	0.4	0.4	U	mg/kg
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	2-AM-4,6-DNT	0.4	0.4	U	mg/kg
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	2-NITROTOLUENE	0.4	0.4	U	mg/kg
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	3-NITROTOLUENE	0.4	0.4	U	mg/kg
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	4-AM-2,6-DNT	0.4	0.4	U	mg/kg
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	4-NITROTOLUENE	0.4	0.4	U	mg/kg
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	HMX	0.4	0.4	U	mg/kg
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	NITROBENZENE	0.4	0.4	U	mg/kg
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	RDX	0.4	0.4	U	mg/kg
		SOIL	8 to 8.5	NA	05/08/02	EXP	SW8330	TETRYL	0.4	0.4	U	mg/kg
		SOIL	8 to 8.5	NA	05/08/02	PCB	SW8082	PCB-1016	34	34	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	PCB	SW8082	PCB-1221	69	69	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	PCB	SW8082	PCB-1232	34	34	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	PCB	SW8082	PCB-1242	34	34	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	PCB	SW8082	PCB-1248	34	34	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	PCB	SW8082	PCB-1254	34	34	U	µg/kg

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-EXCV03 (cont.)	V8021 (cont.)	SOIL	8 to 8.5	NA	05/08/02	PCB	SW8082	PCB-1260	34	34	U	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	4,4'-DDD	3.4	3.3	J	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	4,4'-DDE	3.4	3.8		N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	4,4'-DDT	3.4	15		N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ALDRIN	1.7	1.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ALPHA-BHC	1.7	1.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ALPHA-CHLORDANE	1.7	55		N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	BETA-BHC	1.7	13		N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	DELTA-BHC	1.7	1.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	DIELDRIN	3.4	2.2	J	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ENDOSULFAN I	1.7	1.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ENDOSULFAN II	3.4	3.4	U	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ENDOSULFAN SULFATE	3.4	3.4	U	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ENDRIN	3.4	3.4	U	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ENDRIN ALDEHYDE	3.4	3.4	U	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	ENDRIN KETONE	3.4	3.4	U	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	GAMMA-BHC (LINDANE)	1.7	1.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	HEPTACHLOR	1.7	30		N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	HEPTACHLOR EPOXIDE	1.7	1.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	METHOXYCHLOR	1.7	5.8		N
		SOIL	8 to 8.5	NA	05/08/02	PEST	SW8081A	TOXAPHENE	170	170	U	N
		SOIL	8 to 8.5	NA	05/08/02	RADIO	714R7	U-232	0.041	2.94		N
		SOIL	8 to 8.5	NA	05/08/02	RADIO	714R7	U-233/234	0.038	0.54		N
		SOIL	8 to 8.5	NA	05/08/02	RADIO	714R7	U-235	0.026	0.043	J	N
		SOIL	8 to 8.5	NA	05/08/02	RADIO	714R7	U-238	0.024	0.402		N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	1,1,2,2-TETRACHLOROETHANE	0	240	NJ	Y
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	1,1,2-TRICHLOROETHANE	0	150	NJ	Y
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	1,2,4-TRICHLOROBENZENE	340	340	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	1,2-DICHLOROBENZENE	340	340	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	1,3-DICHLOROBENZENE	340	340	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	1,4-DICHLOROBENZENE	340	340	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2,4,5-TRICHLOROPHENOL	850	850	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2,4,6-TRICHLOROPHENOL	340	340	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2,4-DICHLOROPHENOL	340	340	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2,4-DIMETHYLPHENOL	340	340	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2,4-DINITROPHENOL	850	850	UJ	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2,4-DINITROTOLUENE	340	340	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2-CHLORONAPHTHALENE	340	340	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2-CHLOROPHENOL	340	340	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2-METHYLNAPHTHALENE	340	340	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2-METHYLPHENOL	340	340	U	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2-NITROANILINE	850	850	UJ	N
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	2-NITROPHENOL	340	340	U	N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-EXCV03 (cont.)	V8021 (cont.)	SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	3,3'-DICHLOOROBENZIDINE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	3-NITROANILINE	850	850	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4,6-DINITRO-2-METHYLPHENOL	850	850	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4-BROMOPHENYLPHENYLETHYR	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4-CHLORO-3-METHYLPHENOL	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4-CHLOROANILINE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4-CHLOROPHENYLPHENYLETHYR	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4-METHYLPHENOL	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4-NITROANILINE	850	850	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	4-NITROPHENOL	850	850	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	ACENAPHTHENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	ANTHRACENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BENZO(A)ANTHRACENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BENZO(A)PYRENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BENZO(B)FLUORANTHENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BENZO(G,H,I)PERYLENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BENZO(K)FLUORANTHENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BIS(2-CHLOROETHOXY)METHANE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BIS(2-CHLOROETHYL)ETHER	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BIS(2-CHLOROISOPROPYL)ETHER	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BIS(2-ETHYLHEXYL)PHTHALATE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	BUTYLBENZYL PHTHALATE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	CARBAZOLE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	CHRYSENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	DIBENZO(A,H)ANTHRACENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	DIBENZOFURAN	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	DIETHYL PHTHALATE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	DIMETHYL PHTHALATE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	DI-N-BUTYL PHTHALATE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	DI-N-OCTYL PHTHALATE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	FLUORANTHENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	FLUORENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROBENZENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROBUTADIENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	HEXACHLOROETHANE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	INDENO(1,2,3-CD)PYRENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	ISOPHORONE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	NAPHTHALENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	NITROBENZENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	N-NITROSO-DI-N-PROPYLAMINE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	N-NITROSODIPHENYLAMINE (1)	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	PENTACHLOROPHENOL	850	850	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	PHENANTHRENE	340	340	U	µg/kg
		SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	PHENOL	340	340	U	µg/kg

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-EXCV03 (cont.)	V8021	SOIL	8 to 8.5	NA	05/08/02	SVOA	SW8270C	PYRENE	340	340	U	N
	(cont.)	SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	ALUMINUM	4.59	9290		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	ANTIMONY	2.15		U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	ARSENIC	0.215	3.52	J	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	BARIIUM	0.127	55.5		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	BERYLLIUM	0.121	0.121	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	CADMIUM	0.371	0.371	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	CALCIUM	6.96	2550		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	CHROMIUM	0.628	10.6		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	COBALT	0.707	3.59		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	COPPER	0.483	14.6		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	IRON	1.56	12000		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	LEAD	0.178	4.78	J	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	MAGNESIUM	8.18	3110		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	MANGANESE	0.192	81.6		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	MERCURY	0.0174	0.0174	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	MOLYBDENUM	0.755	0.755	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	NICKEL	0.563	5		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	POTASSIUM	73.2	2490		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	SELENIUM	0.292	0.292	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	SILVER	0.643	0.643	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	SODIUM	7.17	666		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	THALLIUM	0.312	0.312	U	N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	VANADIUM	0.448	20.5		N
		SOIL	8 to 8.5	NA	05/08/02	TMETAL	SW7471A	ZINC	0.295	16.4		N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	1,1,1-TRICHLOROETHANE	9.7	9.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	1,1,2,2-TETRACHLOROETHANE	9.7	9.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	1,1,2-TRICHLOROETHANE	9.7	9.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	1,1-DICHLOROETHANE	9.7	9.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	1,1-DICHLOROETHENE	9.7	9.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	1,2-DICHLOROETHANE	9.7	9.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	1,2-DICHLOROPROPANE	9.7	9.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	2-BUTANONE	19	19	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	2-HEXANONE	19	19	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	4-METHYL-2-PENTANONE	19	19	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	ACETONE	19	32	UJ	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	BENZENE	9.7	9.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	BROMODICHLOROMETHANE	9.7	9.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	BROMOFORM	9.7	9.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	BROMOMETHANE	19	19	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	CARBON DISULFIDE	9.7	9.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	CARBON TETRACHLORIDE	9.7	9.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	CHLOROBENZENE	9.7	9.7	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	CHLOROETHANE	19	19	U	N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	CHLOROFORM	9.7	9.7	U	N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-EXCV03 (cont.)	V8021 (cont.)	SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	CHLOROMETHANE	19	19	U	µg/kg N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	CIS-1,2-DICHLOROETHENE	9.7	9.7	U	µg/kg N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	CIS-1,3-DICHLOROPROPENE	9.7	9.7	U	µg/kg N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	DIBROMOCHLOROMETHANE	9.7	9.7	U	µg/kg N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	ETHYLBENZENE	9.7	9.7	U	µg/kg N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	M/P-XYLENES	19	19	U	µg/kg N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	METHYLENE CHLORIDE	9.7	9.7	UJ	µg/kg N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	O-XYLENE	9.7	9.7	U	µg/kg N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	STYRENE	9.7	9.7	U	µg/kg N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	TETRACHLOROETHYLENE	9.7	9.7	U	µg/kg N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	TOLUENE	9.7	9.7	U	µg/kg N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	TRANS-1,2-DICHLOROETHENE	9.7	9.7	U	µg/kg N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	TRANS-1,3-DICHLOROPROPENE	9.7	9.7	U	µg/kg N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	TRICHLOROETHENE	9.7	9.7	U	µg/kg N
		SOIL	8 to 8.5	NA	05/08/02	VOA	SW8260B	VINYL CHLORIDE	19	19	U	µg/kg N
WG23-SB02	V8004	WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	ALUMINUM	41.7	86.5	J	µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	ANTIMONY	0.5	7.29	J	µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	ARSENIC	3.57	5.33		µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	BARIUM	1	68.3		µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	BERYLLIUM	0.5	0.5	U	µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	CADMIUM	1	1	U	µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	CALCIUM	25.1	38500		µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	CHROMIUM	4.4	4.4	U	µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	COBALT	10.9	10.9	U	µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	COPPER	2.8	4.88	J	µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	IRON	5	63.4	J	µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	LEAD	2.24	2.24	U	µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	MAGNESIUM	38.8	16900		µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	MANGANESE	2	137		µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	MERCURY	0.05	0.05	U	µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	MOLYBDENUM	6.5	117		µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	NICKEL	8.5	8.5	U	µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	POTASSIUM	750	40600		µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	SELENIUM	5.12	5.12	U	µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	SILVER	8.4	8.4	U	µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	SODIUM	3480	1420000		µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	THALLIUM	1.19	1.19	UJ	µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	VANADIUM	2.9	10.6		µg/L N
		WATER	47.1 to 52	NA	03/14/02	DMETAL	SW7041	ZINC	3.2	19	J	µg/L N
		WATER	47.1 to 52	NA	03/14/02	EXP	SW8330	1,3,5-TNB	2	2	U	µg/L N
		WATER	47.1 to 52	NA	03/14/02	EXP	SW8330	1,3-DNB	2	2	U	µg/L N
		WATER	47.1 to 52	NA	03/14/02	EXP	SW8330	2,4,6-TNT	2	2	U	µg/L N
		WATER	47.1 to 52	NA	03/14/02	EXP	SW8330	2,4-DNT	2	2	U	µg/L N
		WATER	47.1 to 52	NA	03/14/02	EXP	SW8330	2,6-DNT	2	2	U	µg/L N
		WATER	47.1 to 52	NA	03/14/02	EXP	SW8330	2-AM-4,6-DNT	2	2	U	µg/L N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-SB02	V8004	WATER	47.1 to 52	NA	03/14/02	EXP	SW8330	2-NITROTOLUENE	2	2	U	N
(cont.)	(cont.)	WATER	47.1 to 52	NA	03/14/02	EXP	SW8330	3-NITROTOLUENE	2	2	U	N
		WATER	47.1 to 52	NA	03/14/02	EXP	SW8330	4-AM-2,6-DNT	2	2	U	N
		WATER	47.1 to 52	NA	03/14/02	EXP	SW8330	4-NITROTOLUENE	2	2	U	N
		WATER	47.1 to 52	NA	03/14/02	EXP	SW8330	HMX	2	2	U	N
		WATER	47.1 to 52	NA	03/14/02	EXP	SW8330	NITROBENZENE	2	2	U	N
		WATER	47.1 to 52	NA	03/14/02	EXP	SW8330	RDX	2	2	U	N
		WATER	47.1 to 52	NA	03/14/02	EXP	SW8330	TETRYL	2	2	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	4,4'-DDD	0.05	0.05	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	4,4'-DDE	0.05	0.05	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	4,4'-DDT	0.05	0.05	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	ALDRIN	0.025	0.025	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	ALPHA-BHC	0.025	0.025	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	ALPHA-CHLORDANE	0.025	0.025	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	BETA-BHC	0.025	0.056	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	DELTA-BHC	0.025	0.025	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	DELDRIN	0.05	0.05	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	ENDOSULFAN I	0.025	0.025	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	ENDOSULFAN II	0.05	0.05	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	ENDOSULFAN SULFATE	0.05	0.05	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	ENDRIN	0.05	0.05	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	ENDRIN ALDEHYDE	0.05	0.05	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	ENDRIN KETONE	0.05	0.05	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	GAMMA-BHC (LINDANE)	0.025	0.025	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	GAMMA-CHLORDANE	0.025	0.025	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	HEPTACHLOR	0.025	0.025	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	HEPTACHLOR EPOXIDE	0.025	0.025	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	METHOXYCHLOR	0.25	0.25	U	N
		WATER	47.1 to 52	NA	03/14/02	PEST	SW8081A	TOXAPHENE	3	3	U	N
		WATER	47.1 to 52	NA	03/14/02	SOLIDS	E160.1	TDS	10	3600	mg/L	N
		WATER	47.1 to 52	NA	03/14/02	SOLIDS	E160.1	TSS	10	99	mg/L	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	1,2,4-TRICHLOROBENZENE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	1,2-DICHLOROBENZENE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	1,3-DICHLOROBENZENE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	1,4-DICHLOROBENZENE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	2,4,5-TRICHLOROPHENOL	25	25	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	2,4,6-TRICHLOROPHENOL	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	2,4-DICHLOROPHENOL	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	2,4-DIMETHYLPHENOL	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	2,4-DINITROPHENOL	25	25	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	2,4-DINITROTOLUENE	20	20	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	2,6-DINITROTOLUENE	20	20	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	2-CHLORONAPHTHALENE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	2-CHLOROPHENOL	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	2-METHYLNAPHTHALENE	10	10	U	N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-SB02 (cont.)	V8004 (cont.)	WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	2-METHYLPHENOL	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	2-NITROANILINE	25	25	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	2-NITROPHENOL	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	3,3-DICHLOROBENZIDINE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	3-NITROANILINE	25	25	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	4,6-DINITRO-2-METHYLPHENOL	25	25	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	4-BROMOPHENYLPHENYLETHER	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	4-CHLORO-3-METHYLPHENOL	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	4-CHLOROANILINE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	4-CHLOROPHENYLPHENYLETHER	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	4-METHYLPHENOL	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	4-NITROANILINE	25	25	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	4-NITROPHENOL	25	25	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	ACENAPHTHENE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	ANTHRACENE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	BENZO(A)ANTHRACENE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	BENZO(A)PYRENE	1	1	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	BENZO(B)FLUORANTHENE	1	1	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	BENZO(G,H,I)PERYLENE	1	1	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	BENZO(K)FLUORANTHENE	2	2	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	BIS(2-CHLOROETHOXY)METHANE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	BIS(2-CHLOROETHYL)ETHER	2	2	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	BIS(2-ETHYLHEXYL)PHTHALATE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	BUTYLBENZYLPHTHALATE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	CARBAZOLE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	CHRYSENE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	DI-N-BUTYLPHTHALATE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	DI-N-OCTYLPHTHALATE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	DIBENZ(A,H)ANTHRACENE	1	1	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	DIBENZOFURAN	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	DIETHYLPHTHALATE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	DIMETHYLPHTHALATE	20	20	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	EICOSANE	0	20	NJ	Y
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	EICOSANE	0	30	NJ	Y
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	EICOSANE	0	35	NJ	Y
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	FLUORANTHENE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	FLUORENE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	HENEICOSANE	0	25	NJ	Y
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	HENEICOSANE	0	27	NJ	Y
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	HEPTACOSANE	0	22	NJ	Y
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	HEPTACOSANE	0	31	NJ	Y
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	HEPTACOSANE	0	61	NJ	Y
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	HEXAACHLOROBENZENE	1	1	UJ	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	HEXAACHLOROBUTADIENE	10	10	U	N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-SB02 (cont.)	V8004	WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	10	10	U	N
	(cont.)	WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	HEXACHLOROETHANE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	INDENO(1,2,3-CD)PYRENE	1	1	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	ISOPHORONE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	N-HEXADECANOIC ACID	0	26	NJ	Y
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	N-NITROSO-DI-N-PROPYLAMINE	2	2	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	N-NITROSODIPHENYLAMINE (1)	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	NAPHTHALENE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	NITROBENZENE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	NONADECANE	0	43	NJ	Y
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	OCTACOSANE	0	30	NJ	Y
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	OCTADECANOIC ACID	0	85	NJ	Y
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	PENTACHLOROPHENOL	25	25	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	PENTADECANE	0	34	NJ	Y
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	PENTATRIACONTANE	0	29	NJ	Y
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	PHENANTHRENE	20	20	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	PHENOL	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	SVOA	SW8270C	PYRENE	10	10	U	N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	ALUMINUM	41.7	2910	J	N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	ANTIMONY	0.5	8	J	N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	ARSENIC	3.57	6.89		N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	BARIUM	1	92.8		N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	BERYLLIUM	0.5	0.5	U	N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	CADMIUM	1	1	U	N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	CALCIUM	25.1	56600		N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	CHROMIUM	4.4	4.4	U	N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	COBALT	10.9	10.9	U	N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	COPPER	2.8	15.7		N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	IRON	5	3610		N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	LEAD	2.24	2.24	U	N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	MAGNESIUM	38.8	18900		N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	MANGANESE	2	188		N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	MERCURY	0.05	0.05	U	N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	MOLYBDENUM	6.5	123		N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	NICKEL	8.5	8.5	U	N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	POTASSIUM	750	42200		N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	SELENIUM	5.12	5.12	U	N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	SILVER	8.4	8.4	U	N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	SODIUM	3480	1410000		N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	THALLIUM	1.19	1.19	UU	N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	VANADIUM	2.9	16.6		N
		WATER	47.1 to 52	NA	03/14/02	TMETAL	SW7470A	ZINC	3.2	29.6		N
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	1,1,1-TRICHLOROETHANE	1	1	U	N
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	1,1,2,2-TETRACHLOROETHANE	1	1	U	N
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	1,1,2-TRICHLOROETHANE	1	1	U	N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-SB02 (cont.)	V8004 (cont.)	WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	1,1-DICHLOROETHANE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	1,1-DICHLOROETHANE	1	0.25	J	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	1,2-DICHLOROETHANE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	1,2-DICHLOROETHANE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	2-BUTANONE	10	10	UJ	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	2-HEXANONE	10	10	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	4-METHYL-2-PENTANONE	10	10	UJ	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	ACETONE	10	15	UJ	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	BENZENE	1	1.6	J	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	BROMODICHLOROMETHANE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	BROMOFORM	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	BROMOMETHANE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	CARBON DISULFIDE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	CARBON TETRACHLORIDE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	CHLOROBENZENE	1	1	UJ	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	CHLOROETHANE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	CHLOROFORM	1	3.7	UJ	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	CHLOROMETHANE	1	1	UJ	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	CIS-1,2-DICHLOROETHENE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	CIS-1,3-DICHLOROPROPENE	1	1	U	µg/L
WG23-SL01	V8008	WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	DIBROMOCHLOROMETHANE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	ETHYLBENZENE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	MP-XYLENES	1	0.31	J	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	METHYLENE CHLORIDE	2	2	UJ	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	O-XYLENE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	STYRENE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	TETRACHLOROETHYLENE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	TOLUENE	1	1.7	UJ	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	TRANS-1,2-DICHLOROETHENE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	TRANS-1,3-DICHLOROPROPENE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	TRICHLOROETHENE	1	1	U	µg/L
		WATER	47.1 to 52	NA	03/14/02	VOA	SW8260B	VINYL CHLORIDE	1	1	U	µg/L
		SOIL	0 to 2	NA	03/16/02	PCB	SW8082	PCB-1016	16	16	U	µg/kg
		SOIL	0 to 2	NA	03/16/02	PCB	SW8082	PCB-1221	18	18	U	µg/kg
		SOIL	0 to 2	NA	03/16/02	PCB	SW8082	PCB-1232	12	12	U	µg/kg
		SOIL	0 to 2	NA	03/16/02	PCB	SW8082	PCB-1242	15	15	U	µg/kg
		SOIL	0 to 2	NA	03/16/02	PCB	SW8082	PCB-1248	8.4	8.4	U	µg/kg
		SOIL	0 to 2	NA	03/16/02	PCB	SW8082	PCB-1254	8.5	8.5	U	µg/kg
		SOIL	0 to 2	NA	03/16/02	PCB	SW8082	PCB-1260	8.4	8.4	U	µg/kg
		SOIL	0 to 2	NA	03/16/02	PCTMST-3	MOISTURE	PERCENT MOISTURE	0	1.8	%	N
		SOIL	0 to 2	NA	03/16/02	RADIO	RAD CHEM	U-234	0.012	0.73	pCi/g	N
		SOIL	0 to 2	NA	03/16/02	RADIO	RAD CHEM	U-235	0.016	0.054	pCi/g	N
		SOIL	0 to 2	NA	03/16/02	RADIO	RAD CHEM	U-238	0.0046	0.7	pCi/g	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	1,2,4-TRICHLOROETHYLENE	340	340	U	µg/kg
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	1,2-DICHLOROETHYLENE	340	340	U	µg/kg

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-SL01 (cont.)	V8008	SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	1,3-DICHLOROBENZENE	340	340	U	N
	(cont.)	SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	1,4-DICHLOROBENZENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	2,4,5-TRICHLOROPHENOL	850	850	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	2,4,6-TRICHLOROPHENOL	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	2,4-DICHLOROPHENOL	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	2,4-DIMETHYLPHENOL	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	2,4-DINITROPHENOL	850	850	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	2,4-DINITROTOLUENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	2,6-DINITROTOLUENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	2-CHLORONAPHTHALENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	2-CHLOROPHENOL	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	2-METHYLNAPHTHALENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	2-METHYLPHENOL	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	2-NITROANILINE	850	850	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	2-NITROPHENOL	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	3,3'-DICHLOROBENZIDINE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	3-NITROANILINE	850	850	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	4,6-DINITRO-2-METHYLPHENOL	850	850	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	4-BROMOPHENYLENETHYLETHER	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	4-CHLORO-3-METHYLPHENOL	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	4-CHLOROANILINE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	4-CHLOROPHENYLPHENYLETHER	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	4-METHYLPHENOL	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	4-NITROANILINE	850	850	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	4-NITROPHENOL	850	850	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	ACENAPHTHENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	ANTHRACENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	BENZO(A)ANTHRACENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	BENZO(A)PYRENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	BENZO(B)FLUORANTHENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	BENZO(G,H,I)PERYLENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	BENZO(K)FLUORANTHENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	BIS(2-CHLOROETHOXY)METHANE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	BIS(2-CHLOROETHYL)ETHER	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	BIS(2-CHLOROISOPROPYL)ETHER	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	BIS(2-ETHYLHEXYL)PHTHALATE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	BUTYLBENZYLPHTHALATE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	CARBAZOLE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	CHRYSENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	DIBENZ(A,H)ANTHRACENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	DIBENZOFURAN	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	DIETHYLPHTHALATE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	DIMETHYLPHTHALATE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	DI-N-BUTYLPHTHALATE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	DI-N-OCTYLPHTHALATE	340	340	U	N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-SL01 (cont.)	V8008 (cont.)	SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	EICOSANE	0	950	J	Y
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	ETHANE,1,1,2,2-TETRACHLORO-	0	550	UJ	Y
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	FLUORANTHENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	FLUORENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	HEPTADECANE,2,6,10,14-TETRAMET	0	2600	J	Y
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	HEXACHLOROBENZENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	HEXACHLOROBUTADIENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	HEXACHLOROETHANE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	HEXADECANE	0	1000	J	Y
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	HEXADECANE	0	1000	J	Y
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	HEXADECANE	0	1300	J	Y
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	HEXADECANE	0	1400	J	Y
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	HEXADECANE	0	2800	J	Y
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	HEXADECANE,2,6,10,14-TETRAMETH	0	650	J	Y
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	INDENO(1,2,3-CD)PYRENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	ISOPHORONE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	NAPHTHALENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	NITROBENZENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	N-NITROSO-DI-N-PROPYLAMINE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	N-NITROSODIPHENYLAMINE (1)	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	OCTADECANE	0	810	J	Y
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	PENTACHLOROPHENOL	850	850	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	PENTACOSANE	0	1200	J	Y
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	PENTADECANE,2,6,10-TRIMETHYL	0	680	J	Y
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	PHENANTHRENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	PHENOL	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	SVOA	SW8270C	PYRENE	340	340	U	N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	ALUMINUM	4.57	5140		N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	ANTIMONY	2.15	2.15	UJ	N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	ARSENIC	0.215	4.75	J	N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	BARIUM	0.127	41.5	J	N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	BERYLLIUM	0.12	0.183	J	N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	CADMIUM	0.369	12.5		N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	CALCIUM	6.93	7250		N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	CHROMIUM	0.627	3.31		N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	COBALT	-0.705	2.89		N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	COPPER	0.482	12.9		N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	IRON	1.56	7250		N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	LEAD	0.178	2.78	J	N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	MAGNESIUM	8.16	3960		N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	MANGANESE	0.192	114		N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	MERCURY	0.0173	0.0173	U	N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	MOLYBDENUM	0.753	0.753	U	N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	NICKEL	0.561	4.29		N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-SL01 (cont.)	V8008 (cont.)	SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	POTASSIUM	73	2400	mg/kg	N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	SELENIUM	0.291	0.291	U	N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	SILVER	0.641	0.641	U	N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	SODIUM	7.15	475	mg/kg	N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	THALLIUM	0.311	0.311	U	N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	VANADIUM	0.447	13.5	mg/kg	N
		SOIL	0 to 2	NA	03/16/02	TMETAL	SW7471A	ZINC	0.294	15.2	mg/kg	N
		SOIL	0 to 1	NA	03/16/02	PCB	SW8082	PCB-1016	16	16	U	N
		SOIL	0 to 1	NA	03/16/02	PCB	SW8082	PCB-1221	18	18	U	N
		SOIL	0 to 1	NA	03/16/02	PCB	SW8082	PCB-1232	12	12	U	N
WG23-SL02		SOIL	0 to 1	NA	03/16/02	PCB	SW8082	PCB-1242	15	15	U	N
		SOIL	0 to 1	NA	03/16/02	PCB	SW8082	PCB-1248	8.3	8.3	U	N
		SOIL	0 to 1	NA	03/16/02	PCB	SW8082	PCB-1254	8.4	64	U	N
		SOIL	0 to 1	NA	03/16/02	PCB	SW8082	PCB-1260	8.3	120	U	N
		SOIL	0 to 1	NA	03/16/02	PCTMST-3	MOISTURE	PERCENT MOISTURE	0	0.5	%	N
		SOIL	0 to 1	NA	03/16/02	RADIO	RAD CHEM	U-234	0.026	0.66	pCi/g	N
		SOIL	0 to 1	NA	03/16/02	RADIO	RAD CHEM	U-235	0.017	0.022	pCi/g	N
		SOIL	0 to 1	NA	03/16/02	RADIO	RAD CHEM	U-238	0.014	0.61	pCi/g	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	1,2,4-TRICHLOROBENZENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	1,2-DICHLOROBENZENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	1,3-DICHLOROBENZENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	1,4-DICHLOROBENZENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	2,4,5-TRICHLOROPHENOL	840	840	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	2,4,6-TRICHLOROPHENOL	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	2,4-DICHLOROPHENOL	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	2,4-DIMETHYLPHENOL	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	2,4-DINITROPHENOL	840	840	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	2,4-DINITROTOLUENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	2,6-DINITROTOLUENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	2-CHLORONAPHTHALENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	2-CHLOROPHENOL	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	2-METHYLNAPHTHALENE	840	840	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	2-METHYLPHENOL	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	2-NITROANILINE	840	840	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	2-NITROPHENOL	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	3,3'-DICHLOROBENZIDINE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	3-NITROANILINE	840	840	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	4,6-DINITRO-2-METHYLPHENOL	840	840	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	4-BROMOPHENYLENETHYLETHER	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	4-CHLORO-3-METHYLPHENOL	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	4-CHLOROANILINE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	4-CHLOROPHENYLENETHYLETHER	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	4-METHYLPHENOL	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	4-NITROANILINE	840	840	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	4-NITROPHENOL	840	840	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	4-NITROPHENOL	840	840	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	4-NITROPHENOL	840	840	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	4-NITROPHENOL	840	840	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	4-NITROPHENOL	840	840	U	N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-SL02 (cont.)	V8009	SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	ACENAPHTHENE	330	330	U	N
	(cont.)	SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	ANTHRACENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	BENZO(A)ANTHRACENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	BENZO(A)PYRENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	BENZO(B)FLUORANTHENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	BENZO(G,H,I)PERYLENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	BENZO(K)FLUORANTHENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	BIS(2-CHLOROETHOXY)METHANE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	BIS(2-CHLOROETHYL)ETHER	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	BIS(2-CHLOROISOPROPYL)ETHER	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	BIS(2-ETHYLHEXYL)PHthalATE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	BUTYLBENZYLPHthalATE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	CARBAZOLE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	CHRYSENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	DIBENZ(A,H)ANTHRACENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	DIBENZOFURAN	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	DIETHYLPHthalATE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	DIMETHYLPHthalATE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	DI-N-BUTYLPHthalATE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	DI-N-OCTYLPHthalATE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	ETHANE,1,1,2,2-TETRACHLORO-	0	660	U	Y
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	ETHANE,1,1,2-TRICHLORO-	0	320	J	Y
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	FLUORANTHENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	FLUORENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	HEXACHLOROBENZENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	HEXACHLOROBUTADIENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	HEXACHLOROETHANE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	INDENO(1,2,3-CD)PYRENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	ISOPHORONE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	NAPHTHALENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	NITROBENZENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	N-NITROSO-DI-N-PROPYLAMINE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	N-NITROSODIPHENYLAMINE (1)	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	PENTACHLOROPHENOL	840	840	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	PHENANTHRENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	PHENOL	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	SVOA	SW8270C	PYRENE	330	330	U	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	ALUMINUM	4.51	5900		N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	ANTIMONY	2.12	2.12	U	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	ARSENIC	0.212	4.07	J	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	BARIUM	0.125	52.3		N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	BERYLLIUM	0.119	0.171	J	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	CADMIUM	0.364	4.8		N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	CALCIUM	6.84	9160		N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-SL02 (cont.)	V8009 (cont.)	SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	CHROMIUM	0.618	5.69	mg/kg	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	COBALT	0.695	3.18	mg/kg	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	COPPER	0.475	29.1	mg/kg	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	IRON	1.54	8060	mg/kg	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	LEAD	0.175	13.4	mg/kg	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	MAGNESIUM	8.04	4220	mg/kg	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	MANGANESE	0.189	137	mg/kg	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	MERCURY	0.0171	0.0357	J mg/kg	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	MOLYBDENUM	0.742	0.742	U mg/kg	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	NICKEL	0.553	4.51	mg/kg	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	POTASSIUM	72	2700	mg/kg	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	SELENIUM	0.287	0.287	U mg/kg	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	SILVER	0.632	1.73	J mg/kg	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	SODIUM	7.05	372	mg/kg	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	THALLIUM	0.307	0.307	U mg/kg	N
		SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	VANADIUM	0.441	15.3	mg/kg	N
WG23-SL03	V8010	SOIL	0 to 1	NA	03/16/02	TMETAL	SW7471A	ZINC	0.29	58.8	mg/kg	N
		SOIL	0 to 1.3	NA	03/16/02	EXP	SW8330	1,3,5-TNB	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.3	NA	03/16/02	EXP	SW8330	1,3-DNB	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.3	NA	03/16/02	EXP	SW8330	2,4,6-TNT	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.3	NA	03/16/02	EXP	SW8330	2,4-DNT	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.3	NA	03/16/02	EXP	SW8330	2,6-DNT	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.3	NA	03/16/02	EXP	SW8330	2-AM-4,6-DNT	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.3	NA	03/16/02	EXP	SW8330	2-NITROTOLUENE	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.3	NA	03/16/02	EXP	SW8330	3-NITROTOLUENE	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.3	NA	03/16/02	EXP	SW8330	4-AM-2,6-DNT	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.3	NA	03/16/02	EXP	SW8330	4-NITROTOLUENE	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.3	NA	03/16/02	EXP	SW8330	HMX	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.3	NA	03/16/02	EXP	SW8330	NITROBENZENE	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.3	NA	03/16/02	EXP	SW8330	RDX	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.3	NA	03/16/02	EXP	SW8330	TETRYL	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.3	NA	03/16/02	PCTMST-3	MOISTURE	PERCENT MOISTURE	0	1	%	N
WG23-SL04	V8011	SOIL	0 to 1.75	NA	03/16/02	RADIO	RAD CHEM	U-234	0.024	0.84	pCi/g	N
		SOIL	0 to 1.75	NA	03/16/02	RADIO	RAD CHEM	U-235	0.014	0.048	pCi/g	N
		SOIL	0 to 1.75	NA	03/16/02	RADIO	RAD CHEM	U-238	0.014	0.75	pCi/g	N
		SOIL	0 to 1.75	NA	03/16/02	EXP	SW8330	1,3,5-TNB	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.75	NA	03/16/02	EXP	SW8330	1,3-DNB	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.75	NA	03/16/02	EXP	SW8330	2,4,6-TNT	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.75	NA	03/16/02	EXP	SW8330	2,4-DNT	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.75	NA	03/16/02	EXP	SW8330	2,6-DNT	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.75	NA	03/16/02	EXP	SW8330	2-AM-4,6-DNT	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.75	NA	03/16/02	EXP	SW8330	2-NITROTOLUENE	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.75	NA	03/16/02	EXP	SW8330	3-NITROTOLUENE	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.75	NA	03/16/02	EXP	SW8330	4-AM-2,6-DNT	0.4	0.4	U mg/kg	N
		SOIL	0 to 1.75	NA	03/16/02	EXP	SW8330	4-NITROTOLUENE	0.4	0.4	U mg/kg	N

TABLE A-1: PRELIMINARY ASSESSMENT ANALYTICAL DATA

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Point Name	Sample ID	Matrix	Sample Interval (feet)	Duplicate Sample ID	Sample Date	Analyte Group	Analysis Method	Analyte	Reporting Limit	Concentration	Units	TIC
WG23-SL04	V8011	SOIL	0 to 1.75	NA	03/16/02	EXP	SW8330	HMX	0.4	0.4	U	N
(cont.)	(cont.)	SOIL	0 to 1.75	NA	03/16/02	EXP	SW8330	NITROBENZENE	0.4	0.4	U	N
		SOIL	0 to 1.75	NA	03/16/02	EXP	SW8330	RDX	0.4	0.4	U	N
		SOIL	0 to 1.75	NA	03/16/02	EXP	SW8330	TETRYL	0.4	0.4	U	N
		SOIL	0 to 1.75	NA	03/16/02	PCTMST-3	MOISTURE	PERCENT MOISTURE	0	1	%	N
		SOIL	0 to 1.75	NA	03/16/02	RADIO	RAD CHEM	U-234	0.016	0.59	pCi/g	N
		SOIL	0 to 1.75	NA	03/16/02	RADIO	RAD CHEM	U-235	0.018	0.035	pCi/g	N
		SOIL	0 to 1.75	NA	03/16/02	RADIO	RAD CHEM	U-238	0.012	0.58	pCi/g	N

APPENDIX B

RESPONSE TO AGENCY COMMENTS

- Draft Final Action Memorandum, IRP Site 23, K-2 South Disposal Area, TCRA, NAWS China Lake, California, February 2004 (DT 123-02.18)
- Draft Final Excavation Work Plan, IRP Site 23, K-2 South Disposal Area, Time-critical Removal Action (TCRA), Naval Air Weapons Station (NAWS) China Lake, California, September 2004 (DT 123-02.38)
- Draft Final Sampling and Analysis Plan ([SAP] Field Sampling Plan [FSP]/Quality Assurance Project Plan [QAPP]), Soil and Groundwater Sampling, IRP Site 23, K-2 South Disposal Area, TCRA, NAWS China Lake, California, September 2004 (DT 123-02.38)

DRAFT FINAL ACTION MEMORANDUM, IRP SITE 23, K-2 SOUTH DISPOSAL AREA, TCRA, NAWS, CHINA LAKE, CALIFORNIA

Based on the DTSC letter dated February 24, 2005 disapproving the Draft-final Action Memorandum from Laurie Racca, the Navy was required by the Federal Facilities Site Remediation Agreement [Section 11.3 d (12)] to elevate the general unresolved issues to DTSC and Navy management for informal dispute proceedings. The results of those discussions will be documented in the Navy's response to DTSC general comments numbered 1 to 4.

Comments from: Laurie Racca, DTSC

General Comments:

The state regrets to inform the Navy that, although we believe a removal action at the site is justified, we do not concur with the Action Memorandum for Site 23 for the following reasons:

- 1. Comment:** **Purpose of the Action:** The objective of the action at Site 23 is not consistent with the proposed scope of work. The Internal Draft Action Memorandum stated that *"The primary objective of the proposed TCRA is to reduce the ecological receptors risk associated with the contaminated soils at Site 23 by excavating and removing the area of contamination."* The draft final Action Memorandum does not adequately address the state's comments indicating that an ecological risk benchmark (as opposed to a human health industrial preliminary remedial goal [PRG]) should be used to define the area encompassed by the proposed removal. Additionally, the evaluation of polychlorinated biphenyl (PCB) concentrations in surface debris used to eliminate this area of the site from the removal action, were made using human health risk criteria, not ecological risk criteria. The draft final Action Memorandum states that *"The contaminants at Site 23, however, are not believed to pose a threat to human receptors based on the relative isolation of Site 23 from human populations."* The use of human health industrial risk criteria as a measurement benchmark for the action at Site 23 is inconsistent with the purpose of the removal.

Response: As discussed and agreed to by Navy and DTSC management, the objective of the action remains consistent with the NCP, and will be protective of human health and ecological receptors.

The objective of the action is consistent with the proposed scope of work as stated in both the internal draft action memorandum and the draft final action memorandum. As stated in Section 1.0, the proposed TCRA is intended to (1) **reduce** high levels of hazardous substances in soils largely at or near the surface that may migrate, and (2) **reduce** the potential for migration of near-surface contaminants by surface

Comments from: Laurie Racca, DTSC

General Comments:

drainage, erosion, or wind transport. As a result, the TCRA will substantially reduce the ecological receptors risk associated with the contaminated soils at Site 23 by excavating and removing the areas of source contamination. This is considered to be consistent with the activities detailed in the Draft Final Action Memorandum as it will substantially reduce the risk to ecological receptors by reducing concentrations of beta-BHC by several orders of magnitude (from 2,000 mg/kg to at least 0.32 mg/kg). The use of ecological screening levels for an interim removal action is not considered to be practicable, due to the ESL of 1.0 ug/kg being below the method detection limit for beta-BHC. As discussed and agreed to by Navy and DTSC management, a human health residential preliminary remedial goal [PRG]) will be used to define the area encompassed by the proposed removal. The use of residential PRGs as a screening level is intended to be a practical and attainable interim removal action guideline only (i.e. a “stop dig” concentration) and not a final cleanup standard. Additionally, the removal action will remove the exposure pathway associated with ecological risk from the trench. Removal of site contaminants to 10 feet bgs and replacing excavated materials with clean, imported fill will eliminate the exposure pathway for burrowing mammals. The burrowing depth of mammals present at Site 23 does not exceed approximately 4 feet bgs.

Based on the sampling results from the PA/SI the sample of waste material collected at 8-8.5' bgs during the PA/SI (V8024) collected at W23-EXCV01 exhibited 2,000 mg/kg, while sample (V8019) collected 2' lower at 10-10.5' bgs exhibited non-detect (ND) concentrations of beta-BHC at a laboratory detection limit of 1.8 ug/kg. The use of screening levels near or below the laboratory detection limit for removal actions is not considered to be practicable, nor is it common industry practice as it can lead to chasing minute quantities of contamination at great expense and disturbance to the local ecology.

The surface debris piles are not considered to be part of this removal action as they have not exhibited concentrations of contaminants great enough to warrant removal during an interim source removal action. The maximum PCB concentration detected in samples collected from the surface debris pile (0.12 mg/kg) is less than the ecological PRG for soil (0.371 mg/kg). Additionally, PCBs, metals, explosives, and SVOCs were analyzed but found to be below residential PRGs. As stated in Section 5.1.2 of the draft final action memorandum, residual concentrations of contaminants will be evaluated as part of an ecological and human health risk assessment provided in the on-scene

Comments from: Laurie Racca, DTSC

General Comments:

coordinator's report to be submitted following the interim removal action at Site 23.

2. **Comment: Implementation of the Action:** The implementation of the action at Site 23 is not consistent with a time-critical removal (i.e., six months from notification to completion of action). Site 23 is listed in the Final Site Management Plan (October 2003) as a removal action with an initial submittal date for the draft work plan of July 1, 2004. The Navy first stated their intention to conduct a TCRA at Site 23 in October 2003 during a telephone discussion with DTSC. An internal draft Action Memorandum was not provided until June 2004, and draft work plans were not provided until September 2004. The draft final version of these documents and response to state comments were not provided until February 2, 2005. It is apparent that the removal action at Site 23 is not time-critical as evidenced by the time frame in which the removal action has been planned (i.e., over a year).

Response: Navy and DTSC management have agreed that the removal action will remain time-critical as proposed by the Navy. The presence of the significantly high concentrations of beta-BHC (2,000 mg/kg) located near the surface of Site 23, the potential for these wastes to be exposed by erosion of surface cover materials, and the potential for these wastes to subsequently migrate into the China Lake playa environment justifies removal of Site 23 wastes on a time-critical basis.

3. **Comment: Lack of an Imminent Threat:** The site has been stable since at least 1981 when the placement of waste at Site 23 was stopped. Site visits conducted in 1996 and 2000 noted a drainage crossing the waste trenches but also noted that the contents of the trenches did not appear to have been exposed by erosion. A site visit conducted jointly by the Navy, DTSC and DFG in November 2004 did not reveal evidence of debris being exposed or potential waste migration. With no observed migration of waste over a period exceeding 20 years, and no evidence that migration of the contaminated soil or waste is imminent, a "time-critical" removal action is not supported.

Response: As discussed and agreed to by Navy and DTSC management, the Navy has demonstrated that an imminent threat exists and that a time-critical removal action is appropriate.

The presence of sensitive populations of burrowing mammals at Site 23

Comments from: Laurie Racca, DTSC

General Comments:

presents the potential for ecological exposure to the contaminants at Site 23, located approximately 3 to 4 feet below ground surface. Site contaminants are contained within a depressed trench area showing evidence of erosion due to a shallow drainage that runs across the trench area. Although the site contaminants have been stable since at least 1981, the current lack of indication of contaminant migration is no guarantee that wastes will not be exposed as a result of future erosion to the trench cover. The potential for exposure to burrowing mammals to significantly high concentrations of beta-BHC (2,000 mg/kg) located near the surface of Site 23, the potential for these wastes to be exposed by erosion of surface cover materials, and the potential for these wastes to subsequently migrate into the China Lake playa environment justifies removal of Site 23 wastes on a time-critical basis.

4. **Comment:** **Failure to address ARARS:** As described in the Action Memorandum, CERCLA removal actions “...shall to the extent practicable considering the exigencies of the situation, attain applicable or relevant and appropriate requirements under federal environmental or state environmental facility siting laws.” DTSC and DFG provided a list of ARARs to the Navy in our October 19, 2004 comment letter for Site 23. One of these ARARs is listed below.

- a. Fish and Game Code section 2080 (Added by Stats. 1984, c. 1240, section 2): Endangered species. Action must be taken to conserve endangered species, there can be no released and/or actions that would have a deleterious effect on species or habitat. This section prohibits the take, possession, purchase or sell within the state, any species (including rare native plant species), or any product thereof, that the commission determines to be an endangered or threatened species, or the attempt of any of these acts. This section is applicable and relevant to the extent that there are endangered or threatened species in the area which have the potential of being affected if actions are not taken to conserve the species. This section prohibits releases and/or actions that would have a deleterious effect on species or their habitat. This section and applicable Title 14 regulations should be considered as ARARs.

California Code of Regulations Title 14 section 670.2 provides a listing of the plants of California declared to be Endangered, Threatened or Rare.

California Code of Regulations Title 14 section 670.5 provides a listing of the Animals of California declared to be endangered or threatened.

California Code of Regulations Title 14 section 783 et. seq., provides the implementation regulations for the California Endangered Species Act.

On January 6, 2005, DTSC sent an e-mail copy of our draft CEQA Initial Study for Site 6 to the Navy. The draft CEQA documentation for

Comments from: Laurie Racca, DTSC

General Comments:

Site 6 and Site 23 are similar in that the biological resources at each site are similar and will require the same mitigations. These same requirements will apply to any location at China Lake where the biological resources and habitat are present. DTSC forwarded this information to ensure that the Navy understood what was required to comply with the two ARARs mentioned above (Fish and Game Code 1909 and 2080), as well as with the other DFG ARARs provided for Site 23.

The requirements of the Fish and Game Code were discussed at the January 12, 2005 remedial project manager meeting. During that meeting, the Navy representatives referred to the DFG ARARs as "California Environmental Quality Act (CEQA) requirements." DTSC explained that the CEQA documentation was provided to detail the requirements of the ARARs. The ARARs are driving the need for the mitigations described in the CEQA documentation. The Navy representatives specifically expressed concerns about the requirements for the state listed Mohave Ground Squirrel and the time required to comply with this requirement (i.e., that compliance with the ARAR is "not practicable").

DTSC recognizes that the biological surveys required to comply with the Fish and Game Code will delay the removal action at Site 23. Because the "time-critical" nature of the removal action cannot be supported (refer to DTSC comments 2 and 3), time is available for the Navy to attain the DFG ARARs, and therefore it is practicable to do so. The Navy representatives also stated that they could not comply with the DFG ARARs because the Mohave Ground Squirrel is a "state-listed" species. However, the National Contingency Plan (NCP) does require that CERCLA actions attain state environmental or facility siting laws.

At the January 2005 RPM meeting, DTSC stated our position that if the Navy would not comply with the DFG ARARs, DTSC would not concur with the Action Memorandum. DTSC recognizes that the Navy project managers are trying to find a solution regarding the DFG ARARs. We are hopeful that with continued efforts by both the Navy and DTSC, this issue can be resolved informally without the Navy invoking the formal dispute provisions of section 21 of the Federal Facility Site Remediation Agreement.

Response: Following the January RPM meeting discussing ARARs, the Navy determined that DFG Code 2080 could be considered relevant and appropriate and that mitigation measures could be implemented as part

Comments from: Laurie Racca, DTSC

General Comments:

of the proposed TCRA. This acknowledgement was made in the Navy's January 31, 2005 RTC on the draft document. Further discussions with the DTSC and DFG outlining what the mitigation requirements entailed did not occur due to the receipt of the DTSC comment letter dated February 24, 2005. As a result of the discussions between Navy and DTSC management following receipt of the DTSC's letter the action memorandum will be revised to include discussion of the State ARARs. DFG Code 2080 will be added to the list of "relevant and appropriate" regulations. This will be in addition to the original determination of the Federal Endangered Species Act as "applicable".

Work plans will be modified to indicate that mitigation measures for sensitive species present at Site 23 will be implemented prior to and during the removal action. The mitigation measures are from China Lake's Desert Tortoise Habitat Management Plan.:

1. Worker education programs and well-defined operational procedures shall be implemented to avoid the take of desert tortoises and minimize loss of their habitat.
2. Take of desert tortoises, through injury or death due to the straying of vehicles or equipment beyond project areas, shall be reduced through establishment of clearly defined work areas.
3. Take of desert tortoises, through injury or death, found within proposed project areas shall be reduced through the removal of these animals to safe, undisturbed areas adjacent to project sites. (For Mohave ground squirrels, removal and relocation is much more difficult and not expected to take place. If the opportunity arises, reasonable efforts will be made.)
4. Attraction of common ravens and other potential tortoise predators to project areas shall be reduced to the maximum extent possible by strictly controlling trash and project refuse.
5. The Station shall continue to manage for the benefit of desert tortoises the approximately 200,000 acres within the Station as described in the original biological opinion for the Management Plan.

The mitigation measures implemented for the protection of the desert tortoise will also be protective of special status species that may be present at Site 23.

Comments from: Laurie Racca, DTSC

Specific Comments – Draft Final Action Memorandum

5. **Comment:** **Section 1.0, page 1, second paragraph:** The stated objective of the TCRA has changed. The internal draft version of the Action Memorandum stated that the purpose was to reduce risk to ecological receptors. The draft final version has restated the purpose of the removal action as reducing the migration potential of the contaminated soil and debris. If the true purpose of the removal action is to reduce the potential for migration of contaminated soil and/or debris, then the time-critical aspect of the removal is not justified (please refer to DTSC comment 3, above).

Response: Introductory text of the draft final action memorandum was revised to reflect the changes made in section 5.1.1 as a result of DTSC comment General Comment 2 on the draft action memorandum. While the primary objectives within the Section 1.0 introductory text has been modified to emphasize the reduction of migration potential as one of the justifications for the TCRA, the factors set forth within the NCP as justification for the proposed TCRA and that pertain to Site 23 remain unchanged from the original submission of the internal draft action memorandum.

As stated in Section 5.1.2 of the draft final action memorandum, residual concentrations of contaminants will be evaluated as part of a risk assessment provided in the on-scene coordinator's report to be submitted following the interim removal action at Site 23. If necessary, the risk to ecological receptors will be re-evaluated following the proposed TCRA as part of the ongoing 11-site PA/SI or as part of an expanded SI following the completion of the TCRA. The TCRA is intended as an interim removal action to remove the source area of contamination, not as a final remedy for Site 23.

6. **Comment:** **Section 1.0, Page 1, second paragraph:** The reference to the TCRA as a "complete cleanup" should be deleted.

Response: The phrase "complete cleanup" will be modified to "removal action."

7. **Comment:** **Section 1.0 Purpose, page 2, first paragraph:** Installation of additional temporary wells is not appropriate. Temporary wells will not accurately assess the direction of groundwater movement. Additionally, the presence of beta-BHC in groundwater does not need to be verified. Previous sampling using a temporary well has already documented that benzene in groundwater exceeds the maximum contaminant level (MCL), and both beta-BHC and benzene in groundwater exceed the tap water PRG. The data provided in the previous report that encompassed

Comments from: Laurie Racca, DTSC

Specific Comments – Draft Final Action Memorandum (Continued)

Site 23 was of acceptable quality. The Navy has used temporary wells at many locations within China Lake NAWS, and continues to do so. If there is any doubt about the quality of data from temporary wells installed at China Lake NAWS, then their use as an investigative tool for screening purposes should be halted immediately. Permanent monitoring wells should be installed at the site to provide accurate, repeatable groundwater flow direction and groundwater quality measurements.

Response: The Navy considers installation of temporary wells is considered to be appropriate for the collection of useful information required to determine the extent of contamination and for confirmation of the single data point collected during the PA. The Navy agrees with the DTSC opinion regarding the usefulness of temporary wells. The Navy considers the data obtained from temporary monitoring wells to be useful and of satisfactory quality. The temporary wells are anticipated to be left in-place for a sufficient amount of time to provide information necessary for the potential placement of permanent monitoring wells. The placement of three temporary monitoring wells, through triangulation, will provide valuable information in regards to groundwater flow direction. Industry standards dictate that a minimum of three wells, temporary or permanent, is necessary for the determination of groundwater flow direction. Details regarding surveying to be performed after the placement of the temporary monitoring wells will be added to Section 1.2.2 of the SAP.

- 8. Comment:** **Section 2.1.1, page 2, last paragraph:** Previous reports documented two trenches at the site, not three. Please clarify or correct.

Response: The reference to three trenches will be modified to two trenches.

- 9. Comment:** **Section 2.1.1.4, page 6:** This section should include a description of the desert tortoise burrow observed at the site.

Response: Description will be added to Section 2.1.1.4.

- 10. Comment:** **Section 5.1.1, page 14:** The soil sample analysis should include the tentatively identified compounds detected in soil and groundwater during previous sampling events, or a justification of why these analytes aren't included.

Response: With the exception of beta-BHC and RDX, compounds detected during the PA/SI for Site 23 did not exceed the industrial or residential PRGs used as an action level to trigger interim cleanup. As stated in Section

Comments from: Laurie Racca, DTSC

Specific Comments – Draft Final Action Memorandum (Continued)

5.1.2 of the draft final action memorandum, residual concentrations of contaminants will be evaluated as part of a risk assessment provided in the on-scene coordinator's report to be submitted following the interim removal action at Site 23. As discussed during the March RPM meeting with DTSC and DFG, confirmation sampling will be revised to include the analysis of SVOCs, metals, PCBs, and VOCs for all sidewall samples collected in the upper four feet of the excavation to provide additional data for the subsequent risk assessment.

If necessary, the risk to ecological receptors will be re-evaluated following the proposed TCRA as part of the ongoing 11-site PA/SI or as part of an expanded SI following the completion of the TCRA. The TCRA is intended as an interim removal action to remove the source area of contamination, not as a final remedy for Site 23.

- 11. Comment:** Section 5.1.1, page 15: The reference to “any additional removal sites that may be included” should be explained.

Response: Comment noted. No additional removal sites will be considered as part of the proposed TCRA. Sentence will be deleted.

- 12. Comment:** Section 5.1.2, page 15: Any risk assessment conducted to evaluate residual concentrations of COCs in soil should address both human and ecological risk.

Response: Comment noted. Risk assessments performed following the TCRA at Site 23 will address both human health and ecological risk.

Comments from: Laurie Racca, DTSC

Specific Comments – Draft Final Excavation Work Plan

- 13. Comment:** Section 2.0, page 2: Previous reports documented two trenches at the site, not three. Please clarify or correct.

Response: Text will be modified to reflect that two trenches were originally present at Site 23, rather than three.

- 14. Comment:** Section 3.0, page 9: The exclusion of the surface debris from the proposed removal action was justified using human health risk criteria. The proposed removal action is driven by ecological risk and to prevent migration of contaminants. Therefore, the area of surface debris should be evaluated using ecological risk benchmarks, and/or soil screening levels protective of groundwater.

Response: Ecological risk presented by the surface debris piles will be re-evaluated following the removal action as part of the 11-site PA/SI or an expanded SI. Surface debris piles are not considered to warrant source removal/interim removal action.

- 15. Comment:** Section 3.1, page 10: The pre-mobilization activities conducted by the base biologist should be sufficient to satisfy the DFG ARARs provided to the Navy in October 2004. Additionally, field personnel should be briefed on the requirements of the desert tortoise habitat management plan.

Response: See response to General Comment 4. Based upon agreement reached between Navy and DTSC management, mitigation activities performed in association with the Site 23 TCRA will be sufficient to satisfy pertinent ARARs. Field personnel will be briefed regarding requirements of desert tortoise and MGS protection.

- 16. Comment:** Section 3.2.1.1, page 11: The use of field screening test kits is not sufficient to determine the suitability of material excavated in Phase I for use as backfill for the excavation.

Response: The reference to using excavated Site 23 soils as backfill will be removed. No Site 23 soils will be used as backfill during the TCRA. Clean, imported fill will be used to backfill the excavation at Site 23 following confirmation sampling.

- 17. Comment:** Section 3.2.2, page 13: Industrial PRGs are not acceptable for determining whether waste is hazardous or non-hazardous for disposal purposes. Waste characterization samples should be analyzed in accordance with the receiving facility requirements and the

Comments from: Laurie Racca, DTSC

Specific Comments – Draft Final Excavation Work Plan (Continued)

requirements of the California Health and Safety Code.

Response: Text will be modified to reflect the requirements of the waste receiving facility and the California HSC.

Comments from: Laurie Racca, DTSC

Specific Comments – Attachment 1, Draft Final Sampling and Analysis Plan

- 18. Comment:** **Section 1.1.8, Page 8:** This section should note that regulatory standards (MCLs and tap water PRGs) have already been exceeded for benzene and beta-BHC in groundwater. Please refer to DTSC comment 7, above.

Response: See response to Specific Comment 7. The rationale for installing an additional three temporary monitoring wells is the exceedance of MCLs and tap water PRGs. Temporary monitoring wells are to be installed to further assess contaminant extent and groundwater flow direction and provide additional data necessary for optimum placement of potential traditional monitoring wells.

- 19. Comment:** **Section 1.2.2, Page 10:** Soil characterization samples should be collected from soil stockpiled during Phase I field activities to determine whether it is suitable for backfill purposes.

Response: See response to comment 16. No excavated site soils will be used as backfill.

- 20. Comment:** **Table 3, Data Quality Objectives, Page 12:** Ecological risk benchmarks and soil screening levels for the protection of groundwater should be used instead of human health risk industrial PRGs. As groundwater has already been determined to be impacted with concentrations of benzene above the MCL and beta-BHC above tap water PRGs, traditional groundwater monitoring wells should be installed at the site, not temporary wells.

Response: See response to Specific Comment 7.

- 21. Comment:** **Figures 4 and 5:** The decision flow charts should also be revised to reflect DTSC comment 20. Additionally, it should be noted that leaving temporary wells open while waiting for off-site chemical analysis (as shown on Figure 5) is not acceptable.

Response: See response to Specific Comment 7. It is noted that leaving temporary wells open while waiting for off-site chemical analysis is not acceptable. The Navy does intend to leave temporary monitoring wells open following sampling and pending the receipt of analytical results. Temporary monitoring wells will be constructed in a manner that does not provide a pathway for infiltration.

**DRAFT FINAL EXCAVATION WORK PLAN (INCLUDING ATTACHMENT 1,
SAMPLING AND ANALYSIS PLAN), INSTALLATION RESTORATION
PROGRAM SITE 23, K-2 SOUTH DISPOSAL AREA, TIME-CRITICAL
REMOVAL ACTION, NAWS, CHINA LAKE, CALIFORNIA**

**Comments from: Victoria Lake, Staff Environmental Scientist
Becky Stanton, Ph.D., Associate Toxicologist**

General Comments:

The California Department of Fish and Game – Office of Spill Prevention and Response (DFG-OSPR) received the subject documents for review. The Department of Toxic Substances Control (DTSC) prepared a comment letter on the draft documents that incorporated DFG-OSPR concerns (letter from Laurie Racca, DTSC to Michael Cornell, Naval Facilities Engineering Command and Carolyn Shepherd, NAWS China Lake, dated October 19, 2004). A number of those concerns were not adequately addressed by the U.S. Department of the Navy (DoN) in the response to comments and draft final documents currently under review. Therefore, we are providing this memorandum to identify remaining areas of concern. DFG-OSPR is providing these comments as part of our role as a natural resource trustee for the State of California.

Response: As stated in the DFG memo dated October 4, 2004 to the DTSC, DFG concerns were adequately incorporated into the DTSC comment letter on the Draft action memorandum and work plans for Site 23. In accordance with standard and accepted review procedures, comments on Draft Final documents are to pertain to incorporation of comments received on Draft documents. However, the Navy will address new comments to the extent that they have a direct impact on the proposed TCRA at Site 23.

BACKGROUND

NAWS China Lake is located in the western Mojave Desert of southern California, approximately 150 miles northeast of Los Angeles. The base is actively operated by the DoN. The facility is physically divided into two large areas, the northern China Lake Complex and the southern Randsburg Wash Area, together encompassing approximately 1,700 square miles. NAWS China Lake occurs in portions of Inyo, Kern, and San Bernardino counties.

Site 23, the K-2 South Disposal Area, is located in the K-2 range in the northern section of the China Lake Complex. The site lies adjacent to North Knox Road. From 1951 to 1981, site wastes including construction and demolition debris, ordnance waste, scrap metal, and unopened cans of chlordane was reportedly disposed of in two trenches. The two trenches have since collapsed into one big trench. Several chemicals have been detected during the Preliminary Assessment sampling including royal demolition explosive (RDX), metals, polychlorinated biphenyls (PCBs), and pesticides, particularly benzene hexachloride (BHC). A time-critical removal action (TCRA) is planned for February 2005 to reduce high levels of chemicals to which humans and wildlife are likely exposed, and which are likely to migrate.

**Comments from: Victoria Lake, Staff Environmental Scientist
Becky Stanton, Ph.D., Associate Toxicologist**

General Comments (Continued):

The DTSC comment numbers below refer to the comments provided in the October 19, 2004 DTSC comment letter. Additional comments on the current versions were noted according to the page numbers in the text.

1. **Comment:** *DTSC Comment 3(a).* Since an ecological risk assessment (ERA) has not been conducted for Site 23, sufficient information is still lacking to identify whether risk to ecological receptors will remain following the proposed action. DFG-OSPR requests that the DoN conduct a post-removal action ERA to evaluate if residual levels of site contaminants still pose a risk to ecological receptors. The DoN is proposing to remediate Site 23 to industrial preliminary remediation goals (PRGs). The determination of industrial PRGs was based exclusively on human health exposure and effects, and did not evaluate or account for potential ecological impacts. Furthermore, industrial PRGs are often higher than benchmarks that would be protective of ecological receptors.

Response: See response to DTSC General Comment 1.

2. **Comment:** *DTSC Comment 3(b)* The description of habitat and potential ecological receptors is still lacking. What are the species of *Atriplex* found on the site? What are the other common plant species present? The November 8, 2004 site visit revealed that high plant diversity exists at Site 23, but this is not reflected in the document. Good vegetative cover in the area was also observed, but the document incorrectly states that Site 23 is characterized by "low diversity of vegetation and the relative lack of cover." Please provide an accurate account of the biological resources at Site 23. On page 6, the Mohave Ground Squirrel should be identified as a mammal species that may occur at the site.

Response: The description of Site 23 is not incorrect. The reference to "relative lack of cover" concerns the trench area itself, not the surrounding, undisturbed area. The trench area has some revegetation, but it is sparse and only a few species are present. Since this is the area that will be disturbed by the removal action, the description is relevant and accurate. Additional descriptions of the habitat and ecological receptors would not affect the planned removal action and do not need to be added at this time. These issues will be covered in the follow-on reports and investigations for the site. The addition of the Mohave Ground Squirrel to the list of mammal species is relevant and will be incorporated into the final work plan.

**Comments from: Victoria Lake, Staff Environmental Scientist
Becky Stanton, Ph.D., Associate Toxicologist**

General Comments (Continued):

3. **Comment:** *DTSC Comment 3(b).* Special-status species that may be affected by the removal action are not fully addressed. The document states that before the removal action begins, the NAWS China Lake biologist will conduct a site visit to ensure that the federally endangered desert tortoise will not be affected. Action must also be taken to minimize adverse effects to species of concern to the State, including the Mohave Ground Squirrel, Burrowing Owl, Loggerhead Shrike, Le Conte's Thrasher, California Horned Lark, and shining milkvetch (*Astragalus.lentiginosus* var. *micans*). The bird species listed are also protected under the Migratory Bird Treaty Act.

Response: Comment noted. The Navy anticipates that the mitigation measures to be implemented for the protection of Desert Tortoise and the Mojave ground squirrel at Site 23 will also minimize adverse effects to the additional special status species that may be present at Site 23.

4. **Comment:** *DTSC Comment 5.* The Applicable or Relevant and Appropriate Requirements (ARARs) submitted by DFG-OSPR are not included. Please include these ARARs in the final document.

Response: Please refer to response to DTSC General Comment 4. Text revisions will be made to the Final Action Memorandum to reflect the receipt of state-supplied ARARs and the screening of ARARs determined to be pertinent to the Site 23 TCRA.

5. **Comment:** *Site Chemicals.* The Navy has narrowed the focus to RDX and BHC in the absence of any ecologically relevant comparisons and by an undefined process. DFG-OSPR recommends that all detected chemicals and all chemicals with insufficiently low method detection limits be retained for all subsequent sampling and further evaluation. In addition, please revise all statements that specifically list only RDX and BHC to include this expanded list of chemicals. The analytical method for PCBs in confirmation samples should be sufficiently sensitive to detect ecologically relevant concentrations (e.g., SW1668A).

Response: New comment, see the response to the General Comments introduction. Also, this concern is addressed in the response to DTSC Specific Comment 10.

6. **Comment:** *Proposed Sampling.* Please clearly distinguish the samples taken to define the excavation boundaries, to characterize the excavated material

**Comments from: Victoria Lake, Staff Environmental Scientist
Becky Stanton, Ph.D., Associate Toxicologist**

General Comments (Continued):

for disposal, and to characterize residual contamination. The analytical location (field versus laboratory), method, and detection limits between these three sets should be identified.

Response: New comment, see the response to the General Comments introduction. Also, this concern is addressed in the response to DTSC Specific Comment 10.

**Comments from: Victoria Lake, Staff Environmental Scientist
Becky Stanton, Ph.D., Associate Toxicologist**

Specific Comments – Action Memorandum

7. **Comment:** *DTSC Comment 8.* Supporting information was requested to confirm that no special-status species would be affected by the removal action. Protective measures have only been mentioned for the Desert Tortoise. Please provide protective measures for other special-status species with potential to occur at Site 23.

Response: See response to DTSC General Comment 4. Mitigation measures to be implemented at Site 23 will be protective of all special-status species with potential to occur at Site 23.

8. **Comment:** *DTSC Comment 12.* The exceedance of industrial PRGs should not be a criterion for whether PCBs are included as analytes in further sampling. Potential ecological impacts may occur at concentrations below the industrial PRGs. Given the heterogeneous nature of waste disposal areas, the relative concentration of a chemical in any one location may not provide any information about the likely concentrations of that chemical in other areas. At a minimum the detection of PCBs should trigger the inclusion in the Sampling and Analysis Plan (SAP).

Response: See response to DTSC Specific Comment 14.

9. **Comment:** *DTSC Comment 15.* The use of industrial PRGs to determine appropriate cleanup levels does not ensure that risk to ecological receptors will be reduced to an adequate level. A time-critical removal action is not required to meet the risk-based requirements for a final remedial action. However, a removal action based on industrial PRG levels will likely dictate the necessity of subsequent action to achieve an ecologically protective final site condition. As part of the proposed removal on in a subsequent remedial action, debris and soil should be excavated to levels that are protective of the most sensitive ecological receptor. The necessity of an expanded site investigation (SI) or remedial action must be made in conjunction with a post-removal action risk assessment that evaluates potential risk based on adequate characterization of residual contamination.

Response: See response to DTSC General Comment 1.

**Comments from: Victoria Lake, Staff Environmental Scientist
Becky Stanton, Ph.D., Associate Toxicologist**

Specific Comments – Excavation Work Plan

- 10. Comment:** *DTSC Comment 18.* As mentioned above, the lack of exceedance of industrial PRGs is not an acceptable criterion for ecological protection. Subsequent evaluations will need to consider the surface debris and associated contamination in terms of adequate characterization and potential risk to ecological receptors.

Response: See response to DTSC General Comment 14.

- 11. Comment:** Page 4. Please clarify whether the “surface” soil samples were actually analyzed as composites of 1 to 2 foot sections as shown on the table.

Response: New comment, see the response to the General Comments introduction. As shown in Appendix A surface samples collected from the debris piles were collected at sample intervals ranging from 0-1’bgs, 0-1.3’bgs, 0-1.75’bgs, and 0-2’bgs. According to the field personnel who performed the field work for the PA/SI of Site 23, the one to two foot surface samples sections were individually composited.

- 12. Comment:** Pages 4, 5, 6, 7. As mentioned by DTSC in previous comments on the draft version, analytical results should be compared against both human health and ecological benchmarks.

Response: New comment, see the response to the General Comments introduction. Also, see response to DTSC General Comment 1. Residual concentrations of contaminants will be evaluated as part of an ecological and human health risk assessment provided in the on-scene coordinator’s report to be submitted following the interim removal action at Site 23.

- 13. Comment:** Pages 4, 5, 6. Please include the ranges of arsenic concentrations detected in each set of samples and the range of background concentrations referenced.

Response: New comment, see the response to the General Comments introduction. A reference to the background soil study will be added to Section 2.2.2, though it should be noted that arsenic is not considered a chemical of concern for this removal action.

- 14. Comment:** Page 4. Please describe the relative horizontal and vertical dimensions of each pit.

Response: New comment, see the response to the General Comments introduction.

**Comments from: Victoria Lake, Staff Environmental Scientist
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Specific Comments – Excavation Work Plan (Continued)

However, since this is a simple editorial change that does relate to the TCRA, text will be added to Section 2.2.3 to reference the dimensions of the test pits excavated as part of the PA (approximately 25-feet long and 10-feet deep).

- 15. Comment:** Page 7. Please include the range of concentrations for the antimony, arsenic, and manganese detections and background concentrations.

Response: New comment, see the response to the General Comments introduction. These metals are not chemicals of concern for this TCRA.

- 16. Comment:** Page 7 and Appendix B. Please provide a more accurate description of the plant species present at Site 23. Also, specify that numerous small mammal burrows are present, and that Mohave Ground Squirrel may be occupying them.

Response: New comment, see the response to the General Comments introduction. Also, see the response to General Comment 2.

- 17. Comment:** Page 9. See General Comment 5 above regarding the need to explain the list of site contaminants.

Response: New comment, see the response to the General Comments introduction. Also, see response to DTSC Specific Comment 10.

- 18. Comment:** Page 9. Please explain the rationale for excluding the area of surface debris from the proposed excavation area.

Response: New comment, see the response to the General Comments introduction. Also, see response to DTSC Specific Comment 14.

- 19. Comment:** Page 9. All samples should be analyzed for all site chemicals (not just pesticides and RDX).

Response: New comment, see the response to the General Comments introduction. Also, see response to DTSC Specific Comment 10.

- 20. Comment:** Pages 9, 13. Industrial PRGs are not equivalent to the hazardous waste criteria established in California regulations. Please clarify this distinction for waste characterization and disposal.

Response: New comment, see the response to the General Comments introduction.

**Comments from: Victoria Lake, Staff Environmental Scientist
Becky Stanton, Ph.D., Associate Toxicologist**

Specific Comments – Excavation Work Plan (Continued)

Also, see response to DTSC Specific Comment 17.

- 21. Comment:** Page 9. Please provide further details on how contaminated areas will be “clearly delineated” in the pre-field activities.

Response: New comment, see the response to the General Comments introduction.

Prior to field activities, the trench area will be delineated based upon a combination of the results of the geophysical survey performed during the PA and visual evidence of the trench boundaries, such as subsidence and staking left over from the excavation of the PA test pits.

- 22. Comment:** Page 10. The biologist should evaluate the presence of all special status species (i.e., Table 1), not just the Desert Tortoise.

Response: New comment, see the response to the General Comments introduction. Also, see response to General Comment 3.

- 23. Comment:** Page 10. Please describe what criteria will be used to visually delineate the trench boundaries.

Response: See response to Specific Comment 21.

- 24. Comment:** Page 10. As stated above, please analyze samples for additional analytes, particularly metals, PCBs, and all organochlorine pesticides.

Response: New comment, see the response to the General Comments introduction. Also, see response to DTSC Specific Comment 10.

**Comments from: Victoria Lake, Staff Environmental Scientist
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Specific Comments – Sampling and Analysis Plan (Attachment 1 of Excavation Work Plan)

25. **Comment:** *DTSC Comment 20.* See Comment 5 above. Similarly, tap water PRGs alone are not sufficient to evaluate need for additional wells. Please evaluate the potential pathways of groundwater to plants and burrowing animals, and include the appropriate ecological benchmarks.

Response: See response to DTSC Specific Comment 10.

26. **Comment:** *DTSC Comment 22.* See Comments 6 and 8 above.

Response: See response to Comments 6 and 8.

27. **Comment:** Page 2. Please note that samples are also being collected to provide sufficient data for the subsequent risk assessments, and as such, should include all site chemicals.

Response: New comment, see the response to the General Comments introduction. Also, see response to DTSC General Comment 10.

28. **Comment:** Figure 2. Please list results of all chemical detected or clearly describe why only certain data were presented (e.g., locations with detected concentrations exceeding industrial PRGs).

Response: New comment, see the response to the General Comments introduction. Figure 2 only presented the sample data for the TCRA area. The nearby surface debris pile is not part of the TCRA.

29. **Comment:** Page 8. Please include ecological benchmarks for soil and groundwater for comparison.

Response: New comment, see the response to the General Comments. Also see the response to DTSC General Comment 1.

30. **Comment:** Pages 9, 29, 30. As mentioned above, the analyte list should be expanded to include all detected chemicals and those for which insufficiently sensitive analytical methods were used previously.

Response: New comment, see the response to the General Comments. Also, see response to DTSC Specific Comment 10.

31. **Comment:** Page 10. Please clarify how the criterion of visible white powder or 10 feet depth, whichever is lower, relates to the previously stated goal of removing all contamination above industrial PRGs, and the proposal to

**Comments from: Victoria Lake, Staff Environmental Scientist
Becky Stanton, Ph.D., Associate Toxicologist**

Specific Comments – Sampling and Analysis Plan (Attachment 1 of Excavation Work Plan (Continued))

excavate soils above industrial PRGs to a maximum 10 foot depth.

Response: New comment, see the response to the General Comments. Although considered unlikely, the presence of visible white powder at a depth of 10 feet bgs is considered to warrant additional removal beyond the previously stated maximum excavation depth of 10 feet bgs to remove visible contaminant source material.

- 32. Comment:** Pages 13, 33. Statements regarding the possible reuse of stockpiled soils are inconsistent with Figure 4 and previous text that only proposed off-site disposal.

Response: New comment, see the response to the General Comments. Also, see the response to DTSC Specific Comment 13.

- 33. Comment:** Page 16. Please specify what quality control procedures will be used for field test kits, including the rationale for why quality control samples are not necessary.

Response: New comment, see the response to the General Comments. QC samples not necessary because off-site laboratory confirmation of 10% of all field immunoassay samples will be performed on a fast turn-around basis.

- 34. Comment:** Pages 19, D-1, and DTSC Comment 35. Please compare reporting limits to applicable ecological benchmarks to ensure the methods are sufficiently sensitive to detect concentrations that may cause ecological effects.

Response: See response to DTSC General Comment 1.

- 35. Comment:** Page 35. Please describe the chemical and physical characteristics by which backfill material will be selected.

Response: New comment, see the response to the General Comments. Also, see the response to DTSC Specific Comment 13.

- 36. Comment:** Page 35. Please explain why the aqueous waste will not be analyzed for explosives.

Response: New comment, see the response to the General Comments introduction.

**Comments from: Victoria Lake, Staff Environmental Scientist
Becky Stanton, Ph.D., Associate Toxicologist**

**Specific Comments – Sampling and Analysis Plan (Attachment 1 of Excavation
Work Plan (Continued))**

Also, see response to DTSC Specific Comment 17.

- 37. Comment:** Page 36. Please include all CAM17 metals rather than only RCRA metals in both confirmation and waste characterization samples.

Response: New comment, see the response to the General Comments introduction. Also, see response to DTSC Specific Comment 17.

- 38. Comment:** Pages D-1 and D-2. Please evaluate the reporting limits for water analysis relative to applicable ecological benchmarks.

Response: New comment, see the response to the General Comments introduction. Also, see response to DTSC Specific Comment 10.

APPENDIX C

SCREENED APPLICABLE, RELEVANT AND APPROPRIATE REQUIREMENTS

On October 19, 2004, the California Department of Toxic Substance Control (DTSC) and the California Department of Fish and Game provided a list of potential ARARs on behalf of the state to the Navy. The Navy reviewed these potential state ARARs and included any state ARARs in Tables 4, 6, and 8 that it determined were ARARs and were more stringent than any identified federal ARARs. Table C-1 in this appendix presents those state identified ARARs that the Navy determined were not ARARs for this TCRA.

TABLE C-1: STATE IDENTIFIED POTENTIAL ARARS

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Requirement	Prerequisite	Citation ^a	Comments
Requirements for identifying, managing, and disposing of hazardous waste.	Waste	Title 22 of the CCR	The Navy has evaluated all the requirements cited by the state contained in Title 22 of the CCR as federal ARARs because the state RCRA program is a federally authorized program; except for 22 CCR §§66261.22(a)(3) and (4), 66261.24(a)(2) through (8), 66261.101, and 66261.3(a)(2)(C) or (F) which are broader in scope than the federal RCRA regulations, and so, were evaluated and identified as state ARARs in Table 4. All requirements contained in Title 22 of the CCR that the Navy identified as ARARs are contained in Tables 3 and 7.
Land use covenants	Hazardous materials, wastes, or constituents at levels unsuitable for unrestricted use of the land.	22 CCR §67391.1	This regulation is not an ARAR for this TCRA. The Navy is not evaluating land use controls as part of this response action and there is no evidence that after completion of this TCRA, hazardous materials, wastes, or constituents will remain on-site at levels unsuitable for unrestricted use.
Requirements for treating, storing, and disposing of hazardous waste.	Waste management units that treat, store, or dispose of hazardous waste	23 CCR §§ 2510, 2511, 2550.10	Title 23 of the CCR is applicable to hazardous waste. The Navy has determined that any requirements in Title 23 that may be applicable or relevant and appropriate to this TCRA are not more stringent than the federal ARARs identified in Title 22 of the CCR. All Title 22 requirements that the Navy has determined are applicable or relevant and appropriate to this TCRA are identified in Tables 3 and 7.
Requirements for discharging designated solid or nonhazardous solid waste to land.	Discharge of designated or nonhazardous solid waste.	27 CCR §§ 20200, 20385, 20415, 20420, 20425, 20430	The Navy has determined that these regulations are not ARARs for this TCRA. These are general applicability provisions and water quality monitoring requirements. The Navy will conduct limited monitoring as part of this TCRA, and, depending on the results of this monitoring will determine if developing a detection, evaluation, or corrective action monitoring program is necessary and appropriate.

TABLE C-1: STATE-IDENTIFIED POTENTIAL ARARS (Continued)

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Requirement	Prerequisite	Citation ^a	Comments
Prohibits discharge or release of a significant amount of any chemical known to the state of California to cause cancer or reproductive toxicity.	Significant amount of a chemical listed in accordance with this Act.	CHSC § 25249.5 et seq.	The Navy has determined that the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) and the regulations implementing it are not ARARs. The Act and its implementing regulations are not directly applicable to the federal government, and the Navy may select health-based standards using other standards and considerations that are protective of human health and the environment.
Requirements for remedial actions.	Remedial action under the authority of the California Health and Safety Act.	CHSC § 25356.1.5	The Navy is conducting this response action under the authority of and consistent with the Defense Environmental Restoration Program, CERCLA, and its implementing regulations contained in the National Hazardous Substance Pollution Contingency Plan. The Navy's response action as embodied in this action memorandum is also consistent to the maximum extent practicable with the requirements of CHSC §25323.1.
Requirements for public water systems.	Public water system.	CHSC § 116365	The Navy is not performing a response action for groundwater; therefore, drinking water standards are not ARARs for this TCRA.
Describes the water basins in the Lahontan region, establishes beneficial uses of groundwater and surface water, established WQOs, including narrative and numerical standards, established implementation plans to meet WQOs and protect beneficial uses, and incorporates statewide water quality control plans and policies.	Waters of the state.	Comprehensive Water Quality Control Plan for the Lahontan Region (Basin Plan) Chapters 3 and 4.	The Navy has determined that the Basin Plan is not an ARAR because a groundwater response action is not a part of this TCRA, and the TCRA excavation will not affect one or more acres (so a stormwater management plan is not required). Limited monitoring is part of this TCRA, and, depending on the results of this monitoring, the Navy will determine if any groundwater response action is necessary and appropriate.
Prohibits release of substances deleterious to plants and wildlife or their habitat.	Substance deleterious to plants or wildlife	Cal. Fish & Game Code §§5650 (a), (b) & (f)	The Navy has determined that this is not at ARAR for this TCRA because there is no evidence that there has been a release that presents an unacceptable risk to plants or wildlife.

TABLE C-1: STATE-IDENTIFIED POTENTIAL ARARS (Continued)

Action Memorandum, IRP Site 23, K-2 South Disposal Area, Time-Critical Removal Action, Naval Air Weapons Station, China Lake, California

Requirement	Prerequisite	Citation ^a	Comments
Prohibits the taking of plants and wildlife and limits the manner in which certain plants and wildlife may be taken.	Circumstances which could result in poisoning of regulated plants and wildlife.	Cal. Fish & Game Code §§ 3005, 1908, 3511, 4700, 3503, 3503.5, 3800, 4150, 4000, et seq. 4800, et seq. 5000, et seq. 5515, 14 CCR §§ 472, 40, 460, 465	The Navy has determined that these statutes and regulations are not ARARs for this TCRA. There is no evidence that the soil has, in fact, poisoned any of these regulated plants or wildlife.

Notes:

a Only the substantive provisions of the requirements cited in this table are potential ARARs

b statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only the substantive requirement of the specific citations are considered potential ARARs

§ Section

ARAR Applicable or relevant and appropriate requirement
CCR California Code of Regulations
Cal/EPA California Environmental Protection Agency
IRP Installation Restoration Program
RCRA Resource Conservation and Recovery Act

